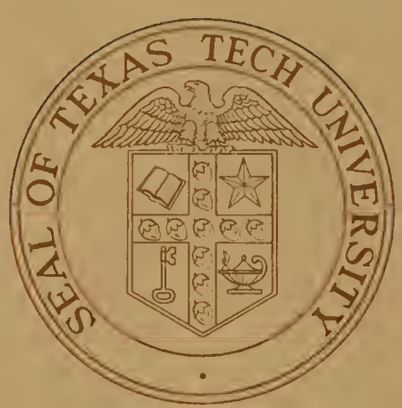
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Systematic Revision of Diplocentrid Scorpions (Diplocentridae) from Circum-Caribbean Lands

Oscar F. Francke

No. 14

May 1978

TEXAS TECH UNIVERSITY

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Systematic Revision of Diplocentrid Scorpions (Diplocentridae) from Circum-Caribbean Lands

Oscar F. Francke

Taxonomically, the scorpion family Diplocentridae Karsch, 1880, has been the most neglected among the Scorpionida. The scarcity of suitable material prior to the advent of the "ultraviolet detection" technique (Honetschlager, 1965; Williams, 1968) seriously hampered any attempt at a comprehensive revision of these fossorial scorpions, leading to scattered, and often erroneous, taxonomic contributions of limited scope.

This family, as a taxonomic unit, can be traced back to Karsch (1880), who united the genera *Diplocentrus* Peters, 1861 and *Cyphocentrus* Karsch, 1880 (= *Nebo* Simon, 1878) to form Diplocentrini. As the modern classification of scorpions emerged during the 1890s, most authors considered this group to be a subfamily of the Scorpionidae. Family ranking was given first by Pocock (1894), who subsequently reverted to recognizing it only as a subfamily. Familial assignment gained broader acceptance after Kraepelin (1905) recognized it as a family and erected two subfamilies: the New World Diplocentrinae and Old World Nebinae. Birula (1917*b*) subdivided Kraepelin's New World Diplocentrinae into two subfamilies, Diplocentrinae for the taxa of the North American mainland (México and United States), and Didymocentrinae for the Caribbean taxa. The latter was never characterized or diagnosed and has no taxonomic justification.

The first two species of diplocentrid scorpions were described by Gervais (1844*a*, 1844*b*), from two New World specimens. Peters (1861) added a third species and erected the type genus *Diplocentrus* on the basis of a Mexican specimen. Simon (1872) described the first Arabian diplocentrid and erected *Nebo* for it in 1878. Simon (1880) erected *Oieclus* for a species described that year from Antigua, Lesser Antilles (Becker, 1880). Pocock (1899) described *Heteronebo* for two new species from "Abd-el-Kuri, Yemen." Kraepelin (1905) separated the Caribbean species of *Diplocentrus* into the new genus *Didymocentrus* Kraepelin. Finally, Stahnke (1968) erected *Bioculus* for 14 species from Baja California, México. The characterization of most genera was inadequate, creating considerable confusion particularly among the New World taxa. Werner (1934) reversed two of the genera of Diplocentrinae, erroneously stating that *Diplocentrus* occurred in the Caribbean islands and *Didymocentrus* in México. Other authors, following Werner's classification, proceeded to describe new species in the wrong genus. Species of *Diplocentrus* were recorded from South America (Schenkel, 1932) and Cuba (Franganillo, 1930, 1935; Moreno, 1938), and species of *Didymocentrus* from México (Caporiacco, 1938; Stahnke, 1968; Williams and Lee, 1975), leading to the taxonomic chaos that presently surrounds this subfamily.

When this study was begun, the Diplocentridae comprised two subfamilies: Nebinae including *Nebo* (one recognized and one doubtful species) and *Heteronebo* (two recognized species); Diplocentrinae, including *Diplocentrus* and *Didymocentrus* (16 recognized species between both genera), *Oieclus* (one species), and *Bioculus* (14 species). Subsequent to the initiation of this work, Armas (1973, 1976) treated the species from Cuba, and Williams and Lee (1975) examined the species from Baja California and synonymized 11 of the 14 species of *Bioculus*, as well as the genus, described by Stahnke from that region. I recently described a new species of *Diplocentrus* from the southwestern United States (Francke, 1975); redescribed the two species originally included in the genus *Heteronebo*, and transferred that genus from the Nebinae to the Diplocentrinae (Francke, 1977*a*); redescribed the type species of the genus *Diplocentrus* as well as three other poorly known species, and described four new species and one subspecies of *Diplocentrus* from the state of Oaxaca, México (Francke, 1977*b*); and redescribed one species and described four new ones, including the first two troglobites of the family, from the Yucatán Peninsula (Francke, 1977*c*).

This contribution forms part of the ongoing revision of the family Diplocentridae and is limited to the taxa occupying the Caribbean islands, Central America, and South America. Research in progress includes the revision of *Nebo*, which may eventually be removed from the family Diplocentridae, and the revision of *Diplocentrus*, which according to the most recent estimate contains nearly 50 species (over two-thirds of them undescribed).

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Systematics

The family Diplocentridae is divided presently into two subfamilies, the characterization of which has been discussed elsewhere (Francke 1977*a*). The subfamily Nebinae is monotypic and endemic to the Arabian Peninsula, and the Diplocentrinae is polytypic and occurs in the New World. The subfamily Diplocentrinae presently contains six genera and approximately 70 species. Of these, five genera and 21 species occur in the circum-Caribbean region and form the subject matter of this contribution. The sixth genus, *Diplocentrus*, occurs in México, Guatemala, and the United States, contains an estimated 50 species, and is the largest and most heterogeneous of the diplocentrid genera. Although characterization of the genus *Diplocentrus* is not yet practicable, following the taxonomic treatment of each of the circum-Caribbean genera, a brief comparison will be made with *Diplocentrus*, indicating characters currently available to distinguish genera. Trichobothrial designations follow Vachon (1974).

For convenient reference, keys to the genera and species treated have been grouped together and precede the Literature Cited. Similarly, tables and figures have been placed in an Appendix at the end of the work. All measurements of specimens reported herein are in millimeters.

Didymocentrus Kraepelin, emended

Scorpio: Gervais, 1844*a*:226, 1844*b*:61 (*nec Scorpio* Linnaeus, 1758).
Buthus: Wood, 1863:365 (*nec Buthus* Leach, 1815).
Cyphocentrus: Simon, 1880:397 (*nec Cyphocentrus* Karsch, 1879).
Diplocentrus: Marx, 1888:91; Pocock, 1893*a*:308 (part ?), 1893*b*:393 (part), 1894:360 (part), 1898:390 (part), 1899:7 (part), 1902:2 (part), 1903:202 (part); Kraepelin, 1893:12 (part), 1896:130, 1899:99 (part), 1901:270 (part); Lönnberg, 1897:197 (part); Banks, 1900:424, 1904:142, 1906:188; Hirst, 1907:210; Comstock, 1912:28 (part), 1940:28 (part); Penther, 1913:243 (part); Lampe, 1918:197; Werner, 1925:540, 1934:275; Franganillo, 1930:49, 1935:20 (part), 1936:156 (part); Hoffmann, 1931:303 (part ?); Hummelinck, 1938:209, 1940:142; Moreno, 1938:192 (part), 1939:107 (part); Roewer, 1943:224; Millot and Vachon, 1949:427 (part ?); Waterman; 1950:168; Gertsch and Soleglad, 1966: 1; Muma, 1967:16; Bücherl, 1967: 112 (part ?).

Didymocentrus Kraepelin, 1905:342 (part); Birula, 1917*a*:59 (part), 1917*b*:162, 191 (part); *nec* Werner, 1934:275; *nec* Caporiacco, 1938:252; Kraus, 1955:103; *nec* Stahnke, 1967:173; Stahnke, 1968:273 (part); *nec* Bücherl, 1969:768; Armas, 1973:1 (part), *nec* 1974*a*:10, *nec* 1974*b*:5, 1976:1 (part); Vachon, 1974:914 (part); *nec* Williams, 1974:14; *nec* Díaz Nájera, 1975:3, 12; Williams and Lee, 1975:1 (part).

Type species.—*Didymocentrus lesueurii* (Gervais), new designation. Kraepelin (1905) erected *Didymocentrus* for the Caribbean taxa then known but failed to designate a type species. Inasmuch as the Caribbean islands are inhabited by a polyphyletic assemblage of diplocentrid scorpions, I am hereby restricting the diagnosis of the genus and designating a type species (type by subsequent designation, International Code of Zoological Nomenclature, Art. 69).

Distribution.—Bonaire, Cuba, Curacao, El Salvador, Grenada, Honduras, Martinique, Nicaragua, St. Lucia, St. Vincent.

Diagnosis.—Metasomal segment V with ventral transverse keel strong, straight to feebly emarginate; chelicera with fixed finger shorter than chela width; movable finger shorter than chela length, distal external tooth closely apposed to distal internal tooth; pedipalp femur wider than deep; chela with ventral median keel oblique, directed towards internal condyle of movable finger articulation, not leaving a distinctly flat ventral face; if carinae are present on dorsal and external faces of manus, then external secondary keel more prominent than either the digital or dorsal secondary carinae; legs with prolateral pedal spurs moderately developed, tarsomere I not bearing pores.

Didymocentrus lesueurii (Gervais), new combination
(Figs. 1, 2, 10, 19, 28-31)

Scorpio (Buthus) lesueurii Gervais, 1844*a*:226, pl. 11, figs. 27-29, 1844*b*:61.

Buthus leseuerii (sic): Wood, 1863:365.

Cyphocentrus lesueurei (sic): Simon, 1880:397.

Diplocentrus lesueurii: Marx, 1888:91; Banks, 1900:424, 1904:142, 1906:188; Comstock, 1912:28, 1940:28; Gertsch and Soleglad, 1966:1; Muma, 1967:16.

Diplocentrus antillanus Pocock, 1893*b*:394, pl. 29, fig. 6, 1898:391 (part); *nec* Kraepelin, 1893:16 (misidentification), 1899:100 (part); Penther, 1913:243 (part ?); Lampe, 1918:197; Werner, 1934:275; Roewer, 1943:224. New synonymy.

Didymocentrus antillanus: *nec* Kraus, 1955:103, figs. 4-6 (misidentification); Stahnke, 1968:274; Williams and Lee, 1975:1.

Type data.—Holotype female of *D. lesueurii* from "Amerique Septentrionale" [here restricted to Saint Lucia]; MNd'HN, examined. Syntypes of *D. antillanus* from Fond-du-Jacques, no date (G. A. Ramage); BM, examined. The female syntype is herewith designated lectotype.

Distribution.—St. Lucia and Martinique, Lesser Antilles.

Diagnosis.—Adults 45-50 mm. total length; fuscous to fuscorufous; pectinal tooth count in males 8-10 (mode, 9), females 7-10 (mode, 8); metasomal segment II length equal to, or greater than, its width; metasomal segment V length greater than twice its width; pedipalp chela fixed finger about as long as femur; chela length less than twice its width in females, greater in males; pedipalp chela width/carapace length ratio greater than 0.75; tarsomere II spine formula 3/3: 4/4: 5/5: 5/5.

Description.—Measurements of *lesueurii* holotype, and *antillanus* lectotype female and paralectotype male in Table 1. The following description is based on females; parenthetical statements refer to males.

Prosoma. Carapace testaceous with moderately dense, variegated fuscous pattern; lustrous (shagreened), densely and minutely punctate. Anterior margin smooth to subgranose, feebly emarginate, median notch rounded. Venter ochreous fuscescent.

Mesosoma. Tergites testaceous with moderately dense, variegated fuscosity; lustrous (shagreened), densely and minutely punctate. Tergite VII disc vestigially bilobed posterolaterally; submedian carinae present on distal one-fourth, vestigial, granulose; lateral keels present on distal one-half, moderately strong, granulose. Genital operculi ochreous, paraboloid (campaniform). Sternites ochreous fuscescent to brunneous; densely, minutely punctate; stigmata elongate-reniform, about two and one-half times longer than wide. Sternite VII tetràcarinate; submedian keels present on distal one-third to one-half, vestigial, smooth; lateral keels present on distal one-half, weak to vestigial, smooth.

Metasoma. Ferrugineous to fusco-ferrugineous; carinae vestigially infuscate; sparsely setate. Ventral submedian carinae on I weak to moderate, smooth, subparallel; II weak, smooth to subcrenate, subparallel; III vestigial, smooth; IV vestigial to obsolete. Ventral lateral carinae on I-II weak to moderate, smooth, slightly divergent distally; III weak, smooth, slightly divergent distally; IV weak to vestigial, smooth (I-IV subgranose to weakly granulose). Lateral inframedian carinae on I weak, subcrenate; II vestigial, subgranose; III-IV vestigial to obsolete. Lateral supramedian carinae on I-II weak to moderate, subgranose; III-IV moderate, feebly granose. Dorsal lateral carinae on I-III weak, subgranose; IV moderate, subgranose. Intercarinae on I-IV densely punctate. Segment V (Figs. 1, 2): ventral median and ventral lateral keels weak to moderate, moderately granulose; ventral transverse keel feebly emarginate with shallow median notch, moderately strong, granose; lateral median keels obsolete; dorsal lateral carinae weak, subgranose; anal arc rounded, anal subterminal keel weak with 12 small oblong granules, anal terminal keel vestigial to obsolete, smooth. Telson densely punctate, moderately setate, feebly granulose ventrolaterally.

Chelicera. Ochreous fuscescent, with vestigial variegated fuscosity dorsally (Fig. 10).

Pedipalp. Ferrugineous to fuscoferrugineous, punctate, orthobothriotaxia C. Femur quadrangular in cross section: dorsal internal keel weak, granulose; dorsal external keel moderate, granulose basally, obsolete distally; ventral external keel obsolete; ventral internal keel moderate, granulose; dorsal face moderately granulose. Tibia (Fig. 19): dorsal internal keel obsolete, basal tubercle moderately strong and granulose; dorsal median keel moderately strong, smooth; dorsal external carina obsolete; external keel obsolete; ventral external keel weak (moderately strong), smooth; ventral median keel obsolete; ventral internal keel weak to moderate, smooth; internal face shagreened. Chela (Figs. 28-31): dorsal margin with basal one-half rounded (sub-

carinate) and smooth (vestigially granulose), distally subcarinate (strongly carinate) and vestigially (weakly) granulose; digital keel vestigial (weak, ending abruptly at level of movable finger articulation), smooth; dorsal secondary and external secondary keels weak to vestigial (very strong, ending gradually at fixed finger base), smooth; ventral external keel obsolete; ventral median keel moderately strong (very strong), smooth; ventral internal keel vestigial to obsolete; internal dorsal keel moderately strong, granulose; internal median and internal ventral keels weak to moderate, smooth. Chelal fingers sparsely setate; dentate margin granulose, without definable pattern, rows, or enlarged granules suggesting such condition.

Legs. Basal segments brunneous with diffuse variegated fuscosity, smooth (shagreened); distal segments ochreous to ochreous fuscescent. Tarsomere II not lobed distally, terminal spine directed ventroapically.

Variation.—Aside from the sexual differences described above, and the usual ontogenic differences observed in diplocentrid scorpions in general (Francke 1975, 1977*b*), only three variable characters appear to be taxonomically important. Previously, the number of lateral eyes in scorpions had been considered to be a reliable taxobasis at the familial level, and, within the Diplocentridae, had been used as a generic character. In the last decade, several authors have reported different instances in which the usefulness of the number of lateral eyes as a taxonomic character breaks down at the familial, generic, and specific levels. The variability observed in *D. lesueurii* is the greatest ever reported in the literature, with 23 per cent of the Saint Lucia specimens and 12.5 per cent of the Martinique specimens studied deviating from the usual condition of three pairs of lateral eyes (Table 9). The variability in pectinal tooth counts and in tarsomere II spine counts is given in Tables 10 and 11, respectively.

Specimens examined.—Holotype of *lesueurii*, "Amerique septentrionale," no date (MNd'HN). SAINT LUCIA: Fond-du-Jacques, no date (G. A. Ramage), 1 ♀ lectotype, 2 ♂♂, 1 juv. ♂ paralectotypes of *antillanus* (BM); 5 April 1969 (R. Roberts), 1 ♂, 2 ♀♀ (CAS), 3 ♂♂, 8 ♀♀, 6 juv. ♂♂, 5 juv. ♀♀ (ENKW); Moule-a-Chique, Vieux Fort, 9 September 1964 (E. Long), 2 ♀♀ (ENKW); Mon Repos, Patience, 28 July 1964 (E. Long), 1 ♂, 2 juv. ♂♂ (ENKW); 23 September 1964 (E. Long), 1 ♀ (ENKW); Ciceron, SW Castries, 13 December 1963 (E. Long), 1 juv. ♀ (ENKW); 4 April 1964 (E. Long), 1 ♀ (ENKW); Marigot Boycet, 10 October 1967 (R. Roberts), 1 ♀ (ENKW); 20 October 1967 (R. Roberts), 4 ♀♀ (ENKW); Castries, 1 April 1969 (R. Roberts), 6 ♀♀, 5 juv. ♂♂, 2 juv. ♀♀ (ENKW); Pigeon Island (near summit, 200 feet), near Castries, 30 July 1963 (E. N. and R. H. Kjellesvig-Waering), 1 ♀, 2 juv. ♀♀ (ENKW). MARTINIQUE: *Ilet Raniers*: 4 November 1953 (R. P. Pinchón), 1 ♀ (MNd'HN); *Preville*: Le Precheur, 27 January 1954 (R. P. Pinchón), 1 ♀ (MNd'HN); 24 April 1954 (R. P. Pinchón), 1 ♀ (MNd'HN); *Tartane*: Morne Jesus, 25 December 1954 (R. P. Pinchón), 5 ♂♂, 3 ♀♀, 7 juv. ♂♂, 4 juv. ♀♀ (MNd'HN); 27 December 1954 (R. P. Pinchón), 1 ♂, 4 ♀♀, 4 juv. ♀♀ (MNd'HN); Le Rocher, 29 December 1954 (R. P. Pinchón), 2 ♂♂, 11 ♀♀, 9 juv. ♂♂, 10 juv. ♀♀ (MNd'HN); LeDiamond, July 1970 (J. P. Gase), 1 ♂ (MNd'HN).

Didymocentrus minor, new species
(Figs. 5, 11, 20, 32-35)

Diplocentrus antillanus: Pocock, 1893*b*:394 (part), 1898:391 (part); Kraepelin, 1899:100 (part); Waterman, 1950:168 (part), (St. Vincent specimens, misidentifications).

Type data.—Holotype male and allotype taken under rocks at Kingstown, St. Vincent, 5 May 1964 (A. Goodgie); ENKW private collection.

Etymology.—From the latin *minor*, meaning smaller. This is the smallest species in the genus.

Distribution.—Known only from the island of St. Vincent, Lesser Antilles.

Diagnosis.—Adults 30-35 mm. in total length; brunneous to brunneotestaceous; pectinal tooth count in males 7-8 (mode, 8), in females 7-8 (mode, 7); metasomal segment II longer than wide, length of V greater than twice its width; pedipalp chela fixed finger shorter than femur; pedipalp chela length equal to or slightly greater than twice its width; pedipalp chela width to carapace length ratio greater than 0.75; tarsomere II spine formula 3/3: 4/4: 5/5: 5/5.

Description.—Measurements of holotype and allotype in Table 1. The following description is based on males; parenthetical statements refer to females.

Prosoma. Carapace brunneous with moderate fuscosity; anterior submargin, anteromedian, and mediolateral regions uniformly infuscate, other areas variegated; shagreened, moderately (densely) punctate. Anterior margin smooth, moderately emarginate, median notch rounded. Carapacial surface shagreened, moderately punctate. Venter ochreous to ochreous fuscescent, sparsely setate, sparsely (moderately) punctate.

Mesosoma. Tergites brunneous with moderate fuscosity; median and posterior submarginal areas uniformly, densely infuscate; anterolaterally, tergites with variegated fuscosity. Tergites I-VI anterolaterally shagreened (lustrous), punctate throughout. Tergite VII vestigially bilobed posterolaterally, median area flat; submedian carinae present on distal one-third, weak to moderate, granulose; lateral carinae present on distal one-half, moderately strong, granulose. Tergite VII shagreened and densely punctate. Genital operculi ochreous, sparsely setate, subtriangular. Sternites ochreous, lateral and posterior margins moderately setate. Sternites III-VI moderately punctate; stigmata relatively small, elongate reniform. Sternite VII tetracarinate with submedian keels on distal one-fourth, weak to vestigial, smooth; lateral keels present on distal one-third, weak to vestigial, smooth; intercarinae moderately punctate.

Metasoma. Brunneous to brunneotestaceous, sparsely setate. Ventral submedian carinae on I weak, smooth, subparallel; II weak to vestigial, smooth, subparallel; III-IV vestigial to obsolete, smooth. Ventral lateral carinae on I-II moderately strong, smooth, subparallel to feebly convergent distally; III-IV weak to moderate, smooth, feebly to moderately divergent distally. Lateral inframedian carinae on I weak to vestigial, subcrenate; II vestigial, smooth; III-IV vestigial to obsolete. Lateral supramedian carinae on I moderate to strong, subgranose; II-IV weak to moderate, smooth. Dorsal lateral carinae on I weak, subgranose; II moderate, subgranose; III-IV moderate, smooth. Intercarinae on I-IV densely punctate. Segment V longer than pedipalp femur, two and one-fourth times longer than wide (Fig. 5); ventral median keel with basal one-half vestigial and smooth, distally weak and sparsely granulose;

ventral lateral carinae moderately strong, with well spaced granules; ventral transverse keel moderately strong, granulose; lateral median keels obsolete; dorsal lateral carinae weak to moderate, smooth to subgranose; anal arc rounded, subterminal keel weak to moderate, with numerous small oblong granules, terminal keel vestigial, smooth; intercarinae on V densely punctate. Telson sparsely setate, vestigially subgranose, densely punctate.

Chelicera. Ochreous with vestigial variegated fuscosity dorsally (Fig. 11).

Pedipalp. Brunneous, punctate, orthobothriotaxia C. Femur sparsely setate, quadrangular in cross section; dorsal internal keel weak, granulose; dorsal external keel with basal two-fifths moderately strong and subgranose, distal three-fifths vestigial to obsolete and smooth; ventral external keel obsolete; ventral internal keel moderate, granulose, curving dorsad distally and merging with dorsal internal keel; internal face sparsely granulose (shagreened). Tibia (Fig. 20): dorsal internal keel obsolete, basal tubercle moderately strong, subgranose; dorsal median keel strong (weak), smooth; dorsal external, and external carinae obsolete; ventral external keel vestigial, smooth; ventral median keel obsolete; ventral internal keel weak to vestigial, smooth; internal face of tibia sparsely shagreened. Chela (Figs. 32-35): dorsal margin on palm rounded and smooth, on fixed finger base feebly to moderately carinate (rounded) and smooth; digital keel obsolete; dorsal secondary keel vestigial (obsolete), smooth; external secondary keel moderately strong (vestigial), smooth; ventral external and ventral internal carinae obsolete; ventral median keel strong (weak to moderate), smooth, directed towards internal condyle of movable finger articulation; internal face with ventrad and mesiad keels vestigial, smooth, outlining depression where chela flexes against tibia; dorsad keel present on distal one-half, weak to vestigial, granulose. Palm bare, densely punctate; fixed finger base weakly concave (flat) internally with weak, smooth keel extending to fixed finger; weakly convex externally, densely punctate. Chelal fingers moderately setate, densely punctate; dentate margins granulose, without definable pattern, rows, or enlarged granules suggesting such condition.

Legs. Basal segments ochreous, distal segments flavous; sparsely to moderately punctate.

Variation.—This species is known only from two adult and eight immature specimens. The immature specimens are less than 15 mm. in length, presumably represent second and third instars, and differ from adults by their pale coloration and in some morphometric ratios. The variability in pectinal tooth counts and tarsomere II spine counts is given in Tables 10 and 11, respectively.

Specimens examined.—SAINT VINCENT: Kingstown, 5 May 1964 (A. Goodgie), ♂ holotype, ♀ allotype, 3 juv. ♂♂ (ENKW); Camden Park Quarry, 27 July 1968 (J. Boos), 2 juv. ♂♂ (ENKW); St. Vincent, July-August ???? (H. H. Smith), 1 juv. ♂, 2 juv. ♀♀ (BM).

Didymocentrus waeringi, new species
(Figs. 6, 12, 21, 36-39)

Type data.—Holotype male taken under logs at Pearls Airport, Grenada, 22 July 1968 (J. Boos); allotype from Tufton Hall, St. Mark's, Grenada, November 1968 (Dr. Groome); ENKW private collection.

Etymology.—This name is a patronym for Dr. Erik N. Kjellesvig-Waering, whose studies on scorpion neontology and paleontology have contributed significantly to our knowledge of the systematics and evolution of this group of organisms.

Distribution.—Known only from the island of Grenada, Lesser Antilles.

Diagnosis.—Adults 37-42 mm. in total length; testaceous to testaceoferrugineous; pectinal tooth count in males 10, in females 9; metasomal segment II longer than wide, segment V length equal to twice its width in females, greater than twice its width in males; pedipalp chela fixed finger shorter than femur in females, approximately as long as femur in males; pedipalp chela length greater than twice its width; pedipalp chela width to carapace length ratio greater than 0.75; tarsomere II spine formula 3/3: 4/4: 5/5: 5/5.

Description.—Measurements of holotype and allotype in Table 2. The following description is based on the males; parenthetical statements refer to females.

Prosoma. Carapace testaceous, distinctly infuscate; anterior and posterior submargins, and median areas uniformly infuscate, other regions with sparse, variegated fuscosity; shagreened (smooth), densely punctate. Anterior margin smooth, feebly emarginate, median notch rounded. Venter ochreous fuscescent, moderately to densely punctate, sparsely setate.

Mesosoma. Tergites testaceous with moderately dense, variegated fuscosity. Tergites I-VI densely punctate, shagreened laterally (lustrous); tergites IV-VI with posterior submargins sparsely granulose (smooth). Tergite VII not bilobed posterolaterally, tetracarinate; submedian keels present on distal one-third, weak, granulose; lateral carinae present on distal two-thirds, moderately strong, granulose; intercarinae densely punctate, laterally sparsely granose. Genital operculi ochreous fuscescent, campaniform. Sternites brunneous. Sternites III-VI moderately punctate; stigmata elongate reniform, relatively small. Sternite VII: submedian keels present on distal submargin, weak to vestigial, smooth; lateral carinae present on distal one-half, vestigial, smooth; intercarinae densely punctate.

Metasoma. Testaceous with moderately infuscate carinae, sparsely to moderately setate. Ventral submedian carinae on I weak, subcrenate (smooth), subparallel; II vestigial, smooth; III-IV obsolete. Ventral lateral carinae on I-II moderate, smooth (subcrenate), parallel; III-IV weak to moderate, smooth, feebly divergent distally. Lateral inframedian carinae on I weak to moderate, subcrenate; II weak to vestigial, smooth; III-IV vestigial (obsolete), smooth. Lateral supramedian carinae on I moderate, granulose; II-III weak to moderate, subgranose; IV vestigial to weak, subgranose. Dorsal lateral carinae on I

weak to moderate, granulose; II-III moderate, granose; IV strong, subgranulose. Segment IV dorsally with submedian longitudinal rows of small granules (smooth), possibly respresenting dorsal submedian keels. Intercarinae on I-IV densely punctate. Segment V slightly longer than pedipalp femur, over (exactly) two times longer than wide (Fig. 6); ventral median keel weak to moderate, with moderately spaced medium-sized granules; ventral lateral carinae moderate to strong, with closely spaced medium-sized granules; ventral transverse keel weak to moderate, slightly emarginate, with sparse medium-sized granules; lateral median carinae present on basal one-third to one-half, vestigial, smooth; dorsal lateral carinae moderate, subgranose; dorsally with (without) submedian longitudinal rows of small granules, possibly representing dorsal submedian keels; anal arc rounded, anal subterminal keel weak, anal terminal keel vestigial to obsolete, smooth. Intercarinae on V densely punctate. Telson sparsely setate, densely punctate.

Chelicera. Ochreous with diffuse fuscosity dorsally, chela moderately punctate (Fig. 12).

Pedipalp. Testaceous, punctate, orthobothriotaxia C. Femur sparsely setate, quadrangular in cross section; dorsal internal carina moderately strong, granulose; dorsal external keel on basal one-third moderately strong, granulose, median one-third weak to vestigial, subgranose, distally obsolete; ventral external keel obsolete; ventral internal keel strong, granulose. Tibia (Fig. 21): dorsal internal keel obsolete, basal tubercle weak, granulose; dorsal median keel strong (weak to moderate), smooth; dorsal external, and external carinae obsolete; ventral external keel weak, smooth; ventral median keel obsolete; ventral internal carina weak (vestigial), subgranose (smooth). Chela (Figs. 36-39): dorsal margin with basal one-third subcarinate, smooth to subgranose, median one-third weakly carinate, sparsely granulose, distal one-third and fixed finger base strongly carinate, sparsely granulose (rounded throughout); digital keel obsolete; dorsal secondary keel moderate (weak), smooth, ending gradually at fixed finger base; external secondary keel very strong, smooth, ending gradually at fixed finger base; ventral external keel obsolete; ventral median carina very strong, smooth; ventral internal keel vestigial basally, obsolete medially and distally; internal face with ventrad and mesiad keels vestigial, smooth, dorsad keel moderately granulose. Fingers sparsely punctate, moderately setate; dentate margins granose without definable pattern, rows, or enlarged granules suggesting such condition.

Legs. Basal segments ochreous fuscescent, moderately punctate, shagreened (smooth); distal segments ochreous, smooth.

Variation.—This species is known only from four males and four females. No variability was observed in pectinal tooth counts (Table 10), but variation in tarsomere II spine counts is given in Table 11.

Specimens examined.—GRENADA: Pearls Airport, 22 July 1968 (J. Boos), 1 ♂ holotype (ENKW); Tufton Hall, St. Mark's, November 1968 (Dr. Groome), 1 ♀ allotype (ENKW); Grande Bois, N. of Grenville, 6 June 1966 (B. C. Bain), 2 ♂♂, 1 juv. ♂ (ENKW); Grand Bras, August 1966 (R. C. Bain), 1 ♀ (ENKW); Mount Gay Estates, Leeward, 30 August ???? (H. H. Smith), 2 ♀♀ (BM).

Didymocentrus hasethi (Kraepelin), new combination
(Figs. 4, 14, 23, 40-43)

Diplocentrus hasethi Kraepelin, 1896:130, fig. 11, 1899:100; Pocock, 1898:392; *nec* Werner, 1925:540 (misidentification); Hummelinck, 1938:209 (part); *nec* Roewer, 1943:224 (misidentification).

Type data.—Holotype female from Curaçao, 4 October 1895 (C. G. de Haseth); ZIZM, examined.

Distribution.—Known only from the island of Curaçao, Lesser Antilles.

Diagnosis.—Adults 45-50 mm. in total length; ochreous fuscescent to fulvous; pectinal tooth count in males 10, in females 8-10 (mode, 9); metasomal segment II longer than wide, segment V length greater than twice its width; pedipalp chela fixed finger approximately as long as femur in females, longer than femur in males; pedipalp chela length less than twice its width, chela width to carapace length ratio greater than 0.75; tarsomere II spine formula 3/3: 4/4: 5/5: 5/5-6.

Description.—Measurements of holotype female and adult male in Table 2. The following description is based on females; parenthetical statements refer to males.

Prosoma. Carapace fulvous with diffuse variegated fuscosity; lustrous (shagreened), densely punctate. Anterior margin smooth (minutely granulose), moderately emarginate, median notch rounded. Venter flavous, sparsely punctate to smooth.

Mesosoma. Tergites densely punctate (smooth), lustrous (shagreened), ochraceous; I-III with sparse variegated fuscosity, IV-V with diffuse vestigial fuscosity, VI-VII without fuscous traces. Tergite VII tetracarinate; submedian keels weak, short, confined to three or four small granules distally; lateral carinae present on distal one-third to one-half, moderately strong, granular; distal margin with transverse, keellike granular row. Genital operculi ochroleucous, ellipsoidal with posterior margins weakly emarginate. Sternites ochreous; III-VI moderately punctate; stigmata elongate, about three times longer than wide; VII tetracarinate, submedian keels present on distal one-third, weak, smooth, lateral carinae present on distal one-half, weak to moderate, smooth, intercarinae moderately punctate.

Metasoma. Fulvous fuscescent, sparsely setate. Ventral submedian carinae on I weak to moderate, smooth, parallel; II weak to vestigial, smooth, parallel; III vestigial to obsolete; IV obsolete. Ventral lateral carinae moderate to strong, smooth; on I subparallel; II parallel; III and IV subparallel on basal two-thirds, moderately divergent on distal one-third. Lateral inframedian carinae on I weak, crenate, complete; II weak to vestigial, subcrenate, complete; III vestigial to obsolete, smooth; IV obsolete. Lateral supramedian carinae on I moderately strong, granose; II moderate, subcrenate; III moderate, weakly crenate; IV weak and smooth on basal one-half, vestigial distally. Dorsal lateral carinae on I weak, subcrenate to granular; II-IV moderate, subcrenate. Intercarinae on I-IV densely punctate. Segment V longer than pedipalp femur, approximately two times longer than wide (Fig. 4); ventral

median, ventral lateral, and ventral transverse carinae moderately strong, granulose; lateral median keels present on basal one-fourth, vestigial, smooth; dorsal lateral carinae granulose, weak medially, moderately strong basally and distally; anal arc rounded, and subterminal keel moderately strong, anal terminal keel obsolete; intercarinae moderately punctate. Telson moderately granulose, sparsely setate, densely punctate.

Chelicera. Chela ochreous with distinct, variegated fuscosity; fingers fuscescent with uniform, diffuse fuscosity (Fig. 14).

Pedipalp. Ochreous fuscescent, punctate, orthobothriotaxia C. Femur quadrangular in cross section; dorsal internal carinae weak to moderate (strong), granose; dorsal external keel with proximal one-third moderate, granular, distally vestigial to obsolete; ventral external carina obsolete; ventral internal keel strong, granose. Tibia (Fig. 23): dorsal internal keel obsolete, basal tubercle weak to moderate, granulose; dorsal median carina strong, smooth; dorsal external and external carinae obsolete; ventral external keel weak to vestigial (to moderate), smooth; ventral median keel obsolete; ventral internal keel weak, rugose; internal face vestigially shagreened. Chela (Figs. 40-43): dorsal margin rounded (subcarinate distally), basally smooth, distally vestigially granulose towards internal face; digital and dorsal secondary carinae obsolete; external secondary keel moderately strong, smooth; ventral external keel obsolete; ventral median carina strong, smooth; ventral internal keel obsolete; internal face with carinae vestigial to obsolete and bearing a shallow longitudinal depression where chela flexes against tibia. Manus bare, densely punctate. Fixed finger base sparsely setate, vestigially shagreened. Fixed finger moderately setate; dentate margin with very subtle emargination basally. Movable finger sparsely setate; dentate margin subtly lobed basally, almost perfectly matching emargination on fixed finger and leaving very narrow gap between them in closed position. Dentate margins of fingers granulose, without definable pattern, rows, or enlarged granules suggesting such condition.

Legs. Basal segments ochreous, vestigially infuscate, moderately punctate; distal segments ochroleucus with fuscous traces, sparsely punctate to smooth.

Variation.—The variability in pectinal tooth counts and tarsomere II spine formulae is given in Tables 10 and 11, respectively.

Specimens examined.—Curaçao: 4 October 1895 (C. G. de Haseth), 1 ♀ holotype (ZIZM); 27 December 1961 (J. and H. Randall), 1 ♂ (ENKW); 11-15 January 1968 (B. Malkin), 1 ♀ (AMNH); Hato, 18 December 1948 (A. D. Ringma), 2 ♂♂, 6 ♀♀, 2 juv. ♀♀ (ZLRU); 1949-1950 (A. D. Ringma), 1 ♂, 2 ♀♀ (ZLRU). Additional locality records given in Hummelinck (1940).

Didymocentrus hummelincki, new species
(Figs. 3, 13, 22, 44-47)

Diplocentrus hasethi: Werner, 1925:540 (misidentification); Hummelinck, 1938:209 (part), 1940:142 (part); Roewer, 1943:224 (misidentification).

Type data.—Holotype female from Kralendijk, Bonaire, September 1961 (Fr. Arnoldo); ZLRU.

Etymology.—This name is a patronym for Dr. P. Wagenaar Hummelinck, Director of the Foundation for Scientific Research in Surinam and the Nederland Antilles, Zoölogisch Laboratorium der Rijks-Universiteit.

Distribution.—Known only from the islands of Bonaire and Klein Bonaire, Lesser Antilles.

Diagnosis.—Adults 40-45 mm. in total length; ochreous fuscescent; pectinal tooth count in males 10, in females 8-10 (mode, 9); metasomal segment II approximately as long as wide, segment V length approximately equal to twice its width; pedipalp chela fixed finger approximately as long as femur; pedipalp chela length less than twice its width; pedipalp chela width to carapace length ratio greater than 0.75; tarsomere II spine formula 4/4: 5/5: 5/6: 5/6.

Description.—Measurements of holotype and paratype females in Table 2. The following description is based on females; adult males are unknown.

Prosoma. Carapace ochreous fuscescent with vestigial, uniform and variegated, fuscosity; anterior submargin with moderately dense, maculated fuscosity; moderately to densely punctate. Anterior margin smooth, feebly emarginate; median notch rounded. Venter ochreous, moderately setate, sparsely punctate.

Mesosoma. Tergites densely punctate; ochreous fuscescent, I-II vestigially infuscate. Tergite VII feebly bilobed posterolaterally, median area slightly depressed; submedian keels vestigial, subgranose; lateral keels weak to moderate, subgranose; posterior margin with transverse, keellike row of granules extending to lateral submargin; lateral intercarinae sparsely punctate, moderately granulose. Genital operculi flavous, paraboloid. Sternites ochreous; III-VI densely punctate, stigmata elongate reniform; VII moderately setate, tetracarinate; submedian keels present on distal one-third, weak to vestigial, smooth; lateral carinae present on distal one-half, weak to moderate, smooth, intercarinae moderately punctate.

Metasoma. Ochreous fuscescent with vestigially infuscate carinae; I, IV, and V moderately setate; II and III sparsely setate. Ventral submedian carinae on I weak, smooth, subparallel; II weak to vestigial, smooth; III vestigial, smooth; IV vestigial to obsolete. Ventral lateral carinae moderate, smooth; I feebly convergent distally, II-III subparallel, IV moderately divergent distally. Lateral inframedian carinae on I weak, subcrenate, complete; II vestigial; III-IV obsolete. Lateral supramedian keels on I moderate, subcrenate; II-III weak to moderate, subcrenate; IV vestigial, subgranose. Dorsal lateral carinae on I weak to vestigial, subgranose; II-III weak, smooth to subgranose; IV moderately strong, smooth. Segment IV dorsally with paired, submedian, vestigial keellike rows of small granules subdistally possibly representing vestiges of dorsal submedian carinae. Intercarinal spaces on I-IV moderately to densely punctate. Segment V longer than pedipalp femur and slightly over two times longer than wide (Fig. 3); ventral median carina moderately strong, with medium and large conical granules irregularly spaced; ventral lateral carinae moderate to strong, coarsely granose; ventral transverse keel moderate, granulose; lateral median keels present on basal one-fourth, vestigial, smooth;

dorsal lateral carinae weak, minutely granulose; anal arc rounded, anal subterminal keel moderately strong with numerous oval and elongate granules, anal terminal keel vestigial to obsolete; intercarinae moderately punctate. Telson punctate, moderately setate, sparsely to moderately granulose.

Chelicera. Ochreous: chela dorsally with distinct, reticulated fuscosity; fingers with diffuse, uniform fuscosity (Fig. 13).

Pedipalp. Ochreous fuscescent, punctate, orthobothriotaxia C. Femur sparsely setate, quadrangular in cross section: dorsal internal carina weak, granulose; dorsal external carina with basal one-third moderately strong, granulose, median one-third weak to vestigial, smooth, distal one-third obsolete; ventral external keel obsolete; ventral internal keel moderately strong, granose. Tibia (Fig. 22): dorsal internal keel obsolete, basal tubercle strong, granulose; dorsal median keel strong, smooth; dorsal external and external carinae obsolete; ventral external keel weak to vestigial, smooth; ventral median keel obsolete; ventral internal keel weak to moderate, smooth; internal face moderately shagreened. Chela (Figs. 44-47): dorsal margin rounded, smooth; digital keel essentially obsolete; dorsal secondary keel vestigial to obsolete, smooth; external secondary keel weak to moderate, smooth; ventral external keel obsolete; ventral median keel moderately strong, smooth; internal face with three vestigial to obsolete keels, ventrad and mesiad carinae smooth, dorsad keel sparsely, minutely granose. Fixed finger base: dorsally and externally moderately setate, densely punctate; internally moderately concave, sparsely setate, moderately punctate, with weak granulose keel extending to fixed finger. Fingers densely setate, moderately punctate; dentate margin granulose, without definable pattern, rows, or enlarged granules suggesting such condition.

Legs. Ochreous; basal segments shagreened, moderately punctate, distal segments smooth.

Variation.—The variability observed in pectinal tooth counts and in tarsomere II spine counts is given in Tables 10 and 11, respectively.

Specimens examined.—BONAIRE: Kralendijk, September 1961 (Fr. Arnoldo), 1 ♀ holotype, 3 ♀♀, 2 juv. ♂♂, 8 juv. ♀♀, 6 juv. (ZLRU); Rincón, September 1961 (Fr. Arnoldo), 10 ♀♀ (ZLRU); Bonaire ?, April 1909 (no collector), 1 ♀ (ZIZM). Additional locality records in Bonaire and Klein Bonaire in Hummelinck (1940).

Didymocentrus trinitarius (Franganillo)
(Figs. 7, 16, 25, 48-51)

Diplocentrus trinitarius Franganillo, 1930:49, 1935:20, 1936:157; *nec* Moreno, 1938:194, 1939:113 (misidentifications).
Didymocentrus trinitarius: Armas, 1973:4, 1976:24.
Didymocentrus jaumei Armas, 1976:11. New synonymy.
Didymocentrus sanfelipensis Armas, 1976:18. New synonymy.

Type data.—Lectotype female of *D. trinitarius* from Montañas de Trinidad, Provincia Las Villas, Cuba, no date (no collector); IZACC. Holotype female of *D. jaumei* from Cayo Conuco, frente a Caibarién, Provincia Las Villas, Cuba, 28 February 1974 (L. F. de Armas); IZACC. Holotype female of *D.*

sanfelipensis from Sabanas de San Felipe, Arroyo Blanco, Provincia Las Villas, Cuba, 30 March 1972 (L. F. de Armas); IZACC.

Distribution.—Known only from Provincia Las Villas, Cuba.

Diagnosis.—Adults 35-40 mm. in total length; ochreous to ochreous fuscescent; pectinal tooth count in males 10, in females 9-10 (mode, 9); metasomal segment II longer than wide; segment V length approximately equal to twice its width in females, greater than twice its width in males; pedipalp chela fixed finger shorter than femur; pedipalp chela length less than twice its width in males, greater than twice its width in females; pedipalp chela width to carapace length ratio greater than 0.75; tarsomere II spine formula 3/3: 4/4: 5/5: 5/5.

Description.—Measurements of adult male and female in Table 3. The following description is based on males; parenthetical statements refer to females.

Prosoma. Carapace ochreous to flavous with distinct variegated fuscosity; anterior and posterior submargins uniformly infuscate; surface minutely punctate, with randomly scattered small granules. Anterior margin emarginate, median notch rounded and shallow. Venter ochroleucus, moderately punctate, sparsely setate.

Mesosoma. Tergites ochreous with diffuse, sparse to moderately dense uniform fuscosity, appearing brunneous to naked eye; coarsely shagreened (lustrous), distinctly punctate. Tergite VII with median area flat to slightly depressed; submedian carinae poorly defined, granulose; lateral carinae indistinct, their presence suggested by coarse granules in general area; surface shagreened, with moderately dense small and medium granulation. Genital operculi paraboloid (ellipsoidal), with feeble posteromedian emarginations. Sternites flavous; III-VI vestigially shagreened submarginally, sparsely punctate medially; stigmata relatively small, elongate, about three times longer than wide. Sternite VII tetracarinate; submedian keels present on distal one-third, vestigial, smooth; lateral carinae present on distal two-thirds, vestigial, smooth; intercarinae sparsely punctate.

Metasoma. Ochreous, distal segments slightly darker than basal segments; carinae brunneous. Ventral submedian carinae on I weak, smooth (subcrenate), subparallel; II weak to vestigial, smooth, subparallel; III vestigial, smooth, slightly divergent distally; IV vestigial to obsolete, represented by few isolated granules. Ventral lateral carinae on I weak, smooth, slightly convergent distally; II weak, smooth, subparallel; III weak, smooth, slightly divergent distally; IV weak to moderately strong, subgranose, moderately divergent distally. Lateral inframedian carinae on I-IV weak to vestigial, subgranose. Lateral supramedian carinae on I-IV weak, subgranose to vestigially crenate. Dorsal lateral carinae on I-IV weak, subgranose. Segments III and IV dorsally with submedian longitudinal rows of medium-sized granules, suggesting vestigial dorsal submedian carinae. Intercarinae on segments I-IV densely punctate; lateral median intercarinae sparsely granose, lateral supramedian and dorsal intercarinae moderately granulose. Segment V longer than pedipalp

femur (Fig. 7); ventral median keel weak to vestigial, with sparse medium-sized granules; ventral lateral carinae moderate to strong, granose; ventral transverse keel moderately strong, with medium to large oblong granules; lateral median carinae present on basal one-half, weak, granulose; dorsal lateral carinae moderately strong, granulose; anal arc rounded, anal subterminal carina weak to moderate, with oblong and elongate granules, anal terminal keel obsolete; intercarinae densely punctate. Telson vestigially granulose, sparsely setate, moderately punctate.

Chelicera. Flavous, chela vestigially infuscate dorsally (Fig. 16).

Pedipalp. Moderately to densely punctate, orthobothriotaxia C. Femur ochreous, quadrangular in cross section; dorsal internal keel strong (moderate), coarsely granulose; dorsal external keel with basal one-half moderately strong (weak), granulose, distal one-half vestigial (obsolete), subgranose; ventral external keel obsolete; ventral internal keel strong, coarsely granulose; ventral and external faces shagreened, internal face minutely granulose, dorsal face densely (sparsely) granulose. Tibia ochreous to ochreous fuscescent (Fig. 25); dorsal internal keel obsolete, basal tubercle weak, granose; dorsal median keel strong (weak), smooth to vestigially crenate; dorsal external keel obsolete; external carina vestigial to obsolete; ventral external keel weak, smooth; ventral median keel obsolete; ventral internal keel weak (vestigial), granose. Chela ochreous fuscescent to brunneous (Figs. 48-51); dorsal margin rounded basally (throughout), vestigially carinate and subgranose medially and distally; digital keel vestigial to obsolete; dorsal secondary keel weak (vestigial), smooth; external secondary keel strong (vestigial), smooth; ventral external keel obsolete; ventral median carina strong (moderate), smooth; ventral internal keel present basally only, weak, smooth; internal face of chela with ventrad and mesiad keels vestigial, subgranose to smooth, dorsad keel obsolete. Chelal faces bare, dorsally with vestigial subgranose reticulation. Fixed finger base externally rugose to vestigially granulose; internally distinctly concave (flat), shagreened. Fingers densely setate, moderately punctate; dentate margins granulose, without definable pattern, rows, or enlarged granules suggesting such condition.

Legs. Flavous, femora and tibiae with external faces shagreened.

Variation.—There are no significant differences between the different populations of *D. trinitarius* examined, and the "differential characters" used by Armas (1976) to erect *D. jaumei* and *D. sanfelipensis* have no taxonomic value whatsoever. The variability observed in pectinal tooth counts is given in Table 10, and that of tarsomere II spine counts in Table 11.

Specimens examined.—Cuba, *Provincia Las Villas*: Las Cuevas, Trinidad, 5 September 1972 (L. F. de Armas), 1 ♂, 1 ♀ (OFF); Finca Santa Martina, Arimao, Cienfuegos, 4 September 1972 (L. F. de Armas, L. R. Hernandez, and L. Zayas), 1 ♂, 2 ♀♀, 1 juv. ♂ (OFF); Carretera Topes de Collantes km. 2, Trinidad, 17 December 1973 (L. F. de Armas, L. R. Hernandez), 2 ♀♀ (AMNH); Cayo Conuco, frente a Caibarien, 7 July 1973 (L. F. de Armas), 2 ♀♀, 1 juv. ♂, 1 juv. ♀ (OFF); 28 February 1974 (L. F. de Armas), 2 ♀♀ (AMNH) [all preceding specimens from Cayo Canuco are paratypes of *D. jaumei* Armas]; Sabanas de San Felipe, Arroyo Blanco, 30 March 1972 (L. F. de Armas), 1 ♂, 6 ♀♀ (OFF), 2 ♀♀ (AMNH) [all preceding specimens from Arroyo Blanco are paratypes of *D. sanfelipensis* Armas].

Didymocentrus nitidus (Hirst), new combination
(Figs. 8, 17, 26, 52-55)

Diplocentrus nitidus Hirst, 1907:210.

Type data.—Holotype female from San Ramón, Río Wanks (375 feet), about 185 miles above Cape Gracias, Nicaragua, July 1905 ("collected by Mr. G. Palmer, purchased of Rosenberg"); BM, examined.

Distribution.—Known only from holotype.

Diagnosis.—Adult female 38.50 mm. in total length; fuscous to fuscorufous; pectinal tooth count 9-9; metasomal segment II wider than long, segment V less than twice its width; pedipalp chela fixed finger shorter than femur; pedipalp chela length greater than twice its width; ratio of pedipalp chela width to carapace length under 0.75; tarsomere II spine formula 4/4: 5/5: 6/6: 6/6.

Description.—Measurements of holotype in Table 3. The following description is based on the holotype.

Prosoma. Carapace lustrous, fuscorufous with distinct piceous variegations; moderately to densely punctate, punctations assuming reticular pattern of underlying piceous pigment. Anterior margin smooth, feebly emarginate, median notch rounded. Venter brunneous, densely punctate, sparsely setate.

Mesosoma. Tergites fuscorufous with distinct piceous variegations; I-VI lustrous, moderately to densely punctate, with punctations in reticular pattern submedially; III-VI with posterior margins vestigially granulose. Tergite VII vestigially bilobed posterolaterally; submedian carinae vestigial, represented by sparse, small granules submarginally; lateral keels present at posterior one-third, moderately strong, coarsely granulose; posterior margin moderately granulose laterally. Tergite VII lustrous, moderately punctate throughout. Genital operculi ochreous fuscescent, paraboloid. Sternites brunneous; III-VI densely punctate, stigmata elongate reniform; VII tetracarinate, submedian and lateral carinae present distally, weak to vestigial, smooth.

Metasoma. Fuscous, sparsely setate. Ventral submedian carinae on I-II weak to vestigial, smooth, feebly convergent distally; III-VI obsolete. Ventral lateral carinae on I moderately strong, smooth, feebly convergent distally; II weak to moderate, smooth, subparallel; III weak to vestigial, smooth, parallel; IV weak, smooth to subcrenate, slightly divergent distally. Lateral inframedian carinae on I vestigial, subgranose; II-III vestigial to obsolete, smooth; IV obsolete. Lateral supramedian carinae moderately strong, on I granose, II-III subgranose, IV smooth to subgranose. Dorsal lateral carinae weak, granulose; on II-III with terminal granule enlarged. Intercarinae on I-IV densely punctate. Segment V longer than pedipalp femur (Fig. 8); ventral median keel weak, granulose; ventral lateral carinae weak to moderate, granulose; ventral transverse keel weak to moderate, granulose; lateral median carinae obsolete; dorsal lateral carinae weak to moderate, granulose; anal arc rounded, anal subterminal keel weak with about 12 small oblong granules,

anal terminal keel vestigial to obsolete; intercarinae densely punctate. Telson lustrous, moderately punctate and setate.

Chelicera. Brunneous with sparse variegated fuscosity (Fig. 17).

Pedipalp. Fuscorufous, punctate, orthobothriotaxia C. Femur quadrangular in cross section; dorsal internal keel weak to moderate, granulose; dorsal external carina with basal one-half weak to moderate, granulose, distal one-half obsolete; ventral external keel obsolete; ventral internal keel moderate, granulose. Tibia (Fig. 26): dorsal internal keel obsolete, basal tubercle moderately strong, subgranose; dorsal median keel weak, smooth; dorsal external, and external carinae obsolete; ventral external keel vestigial, smooth; ventral median keel obsolete; ventral internal keel weak to vestigial, smooth. Chela (Figs. 52-55): dorsal margin of manus rounded, at fixed finger base subcarinate; digital, dorsal secondary, external secondary, and ventral external carinae obsolete; ventral median keel weak to vestigial, smooth; internal carinae vestigial, smooth. Fixed finger base sparsely setate, internally feebly convex; fingers moderately setate, dentate margins granulose, without definable pattern, rows, or enlarged granules suggesting such condition.

Legs. Testaceous, basal segments moderately infuscate. All segments densely punctate.

Didymocentrus krausi, new species
(Figs. 9, 15, 56-59)

Dydymocentrus (sic) antillanus: Kraus, 1955:103, figs. 4-6 (misidentification).

Type data.—Holotype, juvenile female from "200 m von La Unión," El Salvador, 11 September 1951 (A. Zilch); Senckenberg.

Etymology.—This name is a patronym for Professor Otto Kraus, in recognition of his contributions to arachnid phylogeny and systematics.

Distribution.—El Salvador and Honduras, Central America.

Diagnosis.—Known only from two immature females under 30 mm. in total length; ochreous to ochreous fuscescent; pectinal tooth count 9-9; metasomal segment II wider than long, segment V length shorter than twice its width; pedipalp chela fixed finger shorter than femur; pedipalp chela length greater than twice its width; ratio of pedipalp chela width to carapace length under 0.75; tarsomere II spine formula 3/3: 4/4: 5/5: 5/5.

Description.—Measurements of holotype in Table 3. The following description is based on females; males are unknown.

Prosoma. Carapace ochreous with distinct, diffuse fuscous pattern, lustrous, densely punctate. Anterior margin smooth, feebly emarginate, median notch rounded. Venter flavous, sparsely setate, moderately punctate.

Mesosoma. Tergites ochreous with moderately dense, variegated fuscosity; lustrous, densely punctate. Tergite VII not bilobed posterolaterally; submedian keels present on distal one-fifth, vestigial, granulose; lateral carinae present on distal one-half, weak to moderately strong, granulose; posterior submargin transversely granulose on lateral regions; intercarinae sparsely granulose. Genital operculi flavous, campaniform. Sternites flavous,

vestigially punctate; stigmata elongate reniform; VII tetracarinate; submedian carinae present on distal one-fourth, vestigial, smooth; lateral carinae present on distal one-half, vestigial, smooth.

Metasoma. Ochreous, with carinae and distal region of segments diffusely infuscate. Ventral submedian carinae on I weak, finely crenate to smooth, parallel; II with proximal two-thirds weak and smooth, distally vestigial, parallel; III-VI obsolete. Ventral lateral carinae on I-IV weak to moderate, smooth, parallel. Lateral inframedian carinae on I vestigial, subgranose; II-IV obsolete. Lateral supramedian carinae on I moderately strong, finely crenate; II weak to moderate, crenulate; III weak to moderate, with basal one-half smooth and distally crenate; IV with proximal one-third weak and smooth, distal two-thirds vestigial. Dorsal lateral carinae on I weak, crenate; II-IV weak to moderately strong, crenate. Intercarinae on I-IV moderately to densely punctate. Segment V longer than pedipalp femur (Fig. 9); ventral median keel moderately strong, with sparse subconical granules extending into distal disc; ventral lateral carinae moderately strong, granulose; ventral transverse keel granulose; lateral median carinae vestigial to obsolete; dorsal lateral carinae weak to vestigial, finely subcrenate; anal arc rounded, anal subterminal keel weak, with indistinct oblong to elongate granules, anal terminal keel vestigial, smooth; intercarinae densely punctate. Telson vestigially granulose, moderately setate and punctate.

Chelicera. Ochreous; chela dorsally with diffuse variegated fuscosity, (Fig. 15).

Pedipalp. Ochreous, moderately to densely punctate, orthobothriotaxia C. Femur subquadrate in cross section; dorsal internal keel moderately strong, granulose; dorsal external keel with basal one-third weak, subgranose, distal two-thirds vestigial to obsolete, smooth; ventral external keel obsolete; ventral internal keel moderately strong, granulose. Tibia (Fig. 24): dorsal internal keel obsolete, basal tubercle vestigial, subgranose; dorsal median keel weak, smooth; dorsal external, and external carinae obsolete; ventral external keel vestigial to obsolete, smooth; ventral median keel obsolete; ventral internal keel weak, subgranose. Chela (Figs. 56-59): all carinae obsolete except for ventral median, weak, smooth; fingers moderately setate, dentate margins granulose, basally without distinct pattern, distally with distinct median row of small granules flanked internally and externally by numerous slightly larger granules.

Legs. Flavous with diffuse fuscosity, all segments smooth.

Variation.—Juvenile female paratype from Honduras does not differ significantly from holotype. Variability in pectinal tooth counts and tarsomere II spine counts is given in Tables 10 and 11, respectively.

Remarks.—The two known specimens of *D. krausi* have been previously misidentified as being conspecific with, or closely related to, *D. lesueurii* (= *D. antillanus*). A morphometric comparison of *D. krausi* against 10 immatures of *D. lesueurii* of similar size (carapace lengths ranging from 3.30 to 4.20 mm.) have revealed the following differences: in *D. krausi* the ratio of carapace

length to fixed finger length is 1.77-1.81, and in *D. lesueurii* it is 1.40 to 1.50 ($\bar{X}$=1.49); the ratio of chela length to fixed finger length in *D. krausi* is 2.60 to 2.63, whereas in *D. lesueurii* it is 2.29 to 2.39 ($\bar{X}$=2.33).

Specimens examined.—El Salvador: 200 meters from La Unión, 11 September 1951 (A. Zilch), 1 juv. ♀ holotype (Senckenberg). Honduras: Amapala, 22 October 1906 (R. Paesler), 1 juv. ♀ (ZIZM).

Comparative Descriptions

The genus *Didymocentrus* consists of two species groups, the *nitidus* group in Central America and the *lesueurii* group in the Caribbean islands.

The Central American species group contains *D. nitidus* from Nicaragua, and *D. krausi* from El Salvador and Honduras. It can be characterized as follows: carinae on dorsal and external faces of pedipalp chela obsolete; metasomal segment II wider than long; ratio of pedipalp chela width to carapace length less than 0.75; and metasomal segment V length to width ration less than 1.85. The two taxa included in the *nitidus* group can be readily separated by their tarsomere II spine formulae.

The Caribbean species group contains *D. lesueurii* from St. Lucia and Martinique, *D. hasethi* from Curacao, *D. hummelincki* from Bonaire and Klein Bonaire, *D. minor* from St. Vincent, *D. trinitarius* from Cuba, and *D. waeringi* from Grenada. It can be charaterized as follows: chela with at least one carina on dorsal or external faces; metasomal segment II as long as, or longer than, its width; ratio of pedipalp chela width to carapace length greater than 0.75; and metasomal segment V length to width ratio greater than 1.85. Adults of *D. lesueurii*, *D. hasethi*, and *D. hummelincki* have a chela length to width ratio lower than 2.00, attain a total length over 40 mm., and appear to be more closely related among themselves than with any of the other species. Adults of *D. minor* and *D. waeringi* have a chela length to width ratio greater than 2.00, seldom attain 40 mm. in total length, and also appear to be more closely related to each other than to any of the other species. Finally, the relationships of *D. trinitarius* are more problematic. In this taxon, adults are not known to exceed 40 mm. in total length; the chela length to width ratio is lower than 2.00 in males, but greater than 2.00 in females. This intermediacy in chelal morphometrics (due to sexual dimorphism) might represent a more primitive condition, and if that were true it would indicate that *D. trinitarius* became isolated from the parental stock at an early date in the evolutionary history of the Caribbean species group.

D. hummelincki differs from the other species in the Caribbean species group by its higher tarsomere II spine count. *D. lesueurii* differs from *D. hasethi* in coloration and pectinal tooth counts. *D. lesueurii* is fuscous to fuscorufous and males have predominantly 9 teeth per comb, females, 8. *D. hasethi* is ochreous fuscescent to fulvous, and males have 10 teeth per comb whereas females have predominantly 9.

D. minor differs from *D. waeringi* in size and in pectinal tooth counts. Adults of *D. minor* attain 30-35 mm. in total length and have 7-8 pectinal

teeth per comb; males have predominantly 8, females, 7. Adults of *D. waeringi* attain 37-42 mm. in total length and have 9-10 pectinal teeth per comb, males predominantly 10, females, 9.

Compared with *Diplocentrus*, *Didymocentrus* can be readily separated from *Diplocentrus* on the basis of pedipalp chela morphology and body sculpturing. In *Diplocentrus*, the ventral median keel of the chela is usually parallel to the longitudinal axis of the chela, and the digital carina is always more prominently developed than either the dorsal secondary or external secondary carinae. In *Didymocentrus*, the ventral median keel of the chela is distinctly oblique with respect to the longitudinal axis of the chela, and the external secondary keel is always more prominent than either the digital or dorsal secondary carinae. The carapace, tergites, metasoma, and pedipalps of *Didymocentrus* are densely punctate in all instars; certain species of *Diplocentrus* have moderately punctate pedipalps, but carapace, tergites, and metasoma are never punctate.

Tarsoporosus, new genus

Diplocentrus: Schenkel, 1932:391; Mello-Leitão, 1932:28 (part), 1945:31 (part); Caporiacco, 1951:3; Scorza, 1954*a*:165, 1954*b*:158, 1954*c*:192; Esquivel de Verde and Machado-Allison, 1969:29; Bücherl, 1969:768 (part), 1971:14 (*nec Diplocentrus* Peters, 1861).

Type species.—*Diplocentrus kugleri* Schenkel, 1932. Type by monotypy.

Etymology.—From the Latin combining forms *tarso* meaning foot, *por* meaning a pore or small opening, and *ose* meaning "full of," an indicator of quantity. *Tarsoporosus* is a descriptive name, masculine in gender, referring to the diagnostic pores located on tarsomere I of the legs.

Distribution.—Known only from the semi-arid regions of Venezuela and Colombia, South America.

Diagnosis.—Metasomal segments dorsoventrally compressed, approximately one and one-half times wider than deep; segment V with ventral transverse keel strong, arcuate; cheliceral fixed finger shorter than chela width; movable finger shorter than chela length with distal external tooth not closely apposed to distal internal tooth; pedipalp femur deeper than wide; chela with ventral median carina directed towards external condyle of movable finger articulation, leaving a distinctly flat ventral face; manus with digital keel more prominent than either the dorsal secondary or external secondary carinae; all legs with prolateral pedal spurs moderately developed, tarsomere I bearing conspicuous pores on ventral and prolateral areas, denser in females.

Remarks.—*Tarsoporosus* can be distinguished easily from *Diplocentrus* by the conspicuous tarsal pores to which the generic name refers and the strong dorsoventral compression of the metasoma. In *Tarsoporosus*, the pedipalp femur is deeper than wide, and the fixed and movable fingers of the chelicera are shorter than the chela width and length, respectively. The species of *Diplocentrus* that have similar femoral proportions possess chelicerae with the fixed and movable fingers longer than the chela width and length, respectively.

Tarsoporosus kugleri (Schenkel), new combination
(Figs. 18, 27, 60-67)

Diplocentrus kugleri Schenkel, 1932:391; Mello-Leitão, 1932:28, 1945:35; Caporiacco, 1951:3; Scorza, 1954*a*:165, 1954*b*:158, 1954*c*:192, pl. 1, fig. 1; Esquivel de Verde and Machado-Allison, 1969:29; Bücherl, 1969:768, 1971:14.

Type data.—Holotype female from Estado Falcón, Venezuela, 1927 (Dr. H. G. Kugler); NMd'H, Basel, Switzerland, examined.

Distribution.—Known only from the semi-arid regions of northern Venezuela and northeastern Colombia.

Diagnosis.—The diagnosis is the same as that for the genus with the following additions: pectinal tooth count in males 13-15, in females, 10-12; tarsomere II spine formula 4/4-5: 5/5: 6/7: 6/7.

Description.—Measurements of holotype female and adult male in Table 3. The following description is based on females; parenthetical statements refer to males.

Prosoma. Carapace brunneous, anterior and posterior submargins with moderately dense uniform fuscosity, disc with diffuse variegated fuscosity; smooth except for lateral and posterior submargins with sparse, vestigial minute granules (densely shagreened throughout). Anterior margin emarginate; median notch moderately deep, subquadrate with rounded angles. Venter ochreous, sparsely setate; sternum pentagonal.

Mesosoma. Tergites brunneous with diffuse variegated fuscosity throughout; I-VI smooth, lustrous (shagreened); VII tetracarinate; submedian keels very short, present at distal submargin only, weak, granulose; lateral keels present on distal one-third, strong, granulose; median and submedian intercarinae smooth, laterals vestigially granulose. Genital operculi ochreous, ellipsoidal (subquadrate) with feeble anteromedian emargination. Sternites ochreous; III-VI smooth, lustrous; stigmata elongate, approximately eight to 10 times longer than wide. Sternite VII bicarinate (acarinate); submedian keels obsolete; lateral carinae present on distal one-third to one-half, weak, smooth (obsolete); intercarinal spaces smooth.

Metasoma. Basal segments brunneous, distally tending to ferrugineous. Strongly compressed dorsoventrally (Figs. 60-61). Ventral submedian carinae on I weak, smooth, parallel; II-IV obsolete (I-II vestigial, smooth). Ventral lateral carinae on I moderately strong (weak), smooth, subparallel; II weak to vestigial, smooth, subparallel; III-IV obsolete. Lateral inframedian carinae on I with proximal one-half vestigial, distal one-half weak, smooth; II-IV obsolete. Lateral supramedian carinae moderate to strong; on I subgranose, on II vestigially crenate, on III-IV smooth (on II-IV granulose). Dorsal lateral carinae on I strong, smooth to weakly crenate; II-III strong, crenulate; IV moderately strong, crenate (II-IV granulose). Segment IV dorsally with short, subdistal, moderately strong, transverse and posteriorly convex, smooth keel possibly representing medially-fused vestiges of dorsal submedian carinae. Segment V slightly longer than pedipalp femur; ventral median and ventral lateral carinae indistinct, represented by scattered small and medium-sized

granules; ventral transverse keel strong, granulose; lateral median keels present on basal one-half, weak, granulose; dorsal lateral carinae strong, crenate to subgranose; anal arc circular, anal subterminal carina weak, subcrenate; anal terminal keel obsolete. All metasomal intercarinae smooth. Telson strongly compressed dorsoventrally, one and one-half times wider than deep; vesicle dorsally smooth, ventrally and laterally densely granulose (Figs. 60-61).

Chelicera. Ochreous, diffusely infuscate dorsally (Fig. 18).

Pedipalp. Orthobothriotaxia C. Femur ochreous fuscescent, deeper than wide; dorsal internal carina vestigial to obsolete, granulose; dorsal external keel with basal one-half weak, granulose, distally obsolete; ventral internal keel weak to moderate, granulose, curving dorsad distally; ventral external keel obsolete; ventral and external faces smooth, lustrous (shagreened); dorsal and internal faces moderately granulose. Tibia (Fig. 27) ferrugineous; dorsal internal carina obsolete, basal tubercle weak, granulose; dorsal median keel strong, smooth (minutely granulose); dorsal external and external carinae obsolete; ventral external keel weak to vestigial, smooth; ventral median keel obsolete; ventral internal keel weak, sparsely granulose; internal face minutely granulose; ventral, external and dorsal faces smooth, lustrous. Chela fuscoferrugineous, carinae fuscopiceous (Figs. 64-67); dorsal margin strongly carinate extending through fixed finger length, granulose on palm, smooth on fixed finger; digital keel on palm weak and smooth, on fixed finger moderately strong, smooth, extending to level of distal trichobothria; dorsal secondary keel weak to vestigial, smooth, merging with dorsal marginal keel at fixed finger base; external secondary keel vestigial to obsolete; ventral external carina obsolete; ventral median keel very strong, smooth, directed towards external condyle of movable finger articulation; ventral internal keel weak to vestigial, smooth; internal face with ventrad and mesiad keels vestigial, outlining depression where chela flexes against tibia, smooth, dorsad keel moderately granulose. Palm bare, smooth to vestigially rugose, lustrous. Fixed finger base dorsally and externally feebly shagreened, internally with two moderately strong, apically directed granular keels. Fingers sparsely setate; dentate margins granulose, lacking any distinctive pattern and without enlarged granules enabling the recognition of rows of granules.

Legs. Ochreous, moderately contrasting against brunneous opisthosoma. Basal segments smooth, sparsely setate. Tarsomere I on all legs bearing dense pores (*sensilla coeloconica* ?), particularly on ventral and retrolateral regions. Tarsomere I on first pair of legs nearly twice the diameter of tarsomere II, pores quite numerous (Figs. 62-63). Proceeding backwards to second, third, and fourth pair of legs, "swelling" of tarsomere I and number of pores decrease gradually; fourth pair of legs diameter of tarsomeres I and II almost equal, and tarsomere I bears few pores. Tarsomere II not lobed distally (Fig. 62).

Variation.—This species is known only from adult specimens, and it is not known at what stage in their development the pores on tarsomere II appear. The variability in tarsomere II spine counts appears in Table 11. Variation observed in pectinal teeth is as follows: in males, seven combs with 13 teeth, one

comb each with 14 and 15 teeth, respectively; in females, two combs with 10 teeth, three combs with 11 teeth, and one comb with 12 teeth.

Specimens examined.—VENEZUELA: *Estado Falcón*: 1927 (Dr. H. G. Kugler), 1 ♀ holotype (MNd'H, Basel); Distrito Acosta, Riecito-Araurinia, September 1938 (Dr. H. G. Kugler), 1 ♀ (MNd'H, Basel); Taratara, no date (A. R. Lancini), 1♀ (IB); Coro, 26 July 1952 (J. Racenis), 1 ♀ (UCV); *Estado Zulia*: Maracaibo, no date (U. Bomberg), 2 ♂♂ (IB); December 1951 (O. Nuñez), 1 ♀ (UCV); *Estado Lara*: Barquisimeto, January 1950 (G. Marcuzzi); 1 ♀ (UCV). COLOMBIA: *Departamento Cesar*: Becerril, 13 September 1969 (B. Malkin), 1 ♂ (MACN); Valledupar, 21-24 May 1968 (B. Malkin), 1♂(AMNH); *Departamento Guajira*: Merochon, 5 km. SE Uribia, 20 August - 3 September 1969 (B. Malkin), 1 ♂ (AMNH).

Cazierius, new genus

Diplocentrus (in part): Karsch, 1880:407; Pocock, 1893*a*:308, 1893*b*:393, 1894:360, 1898:390, 1899:7, 1902:2, 1903:202; Kraepelin, 1893:12, 1899:99, 1901:270; Lönnberg, 1897:197; Mello-Campos, 1924:290, 355; Hoffmann, 1931:303; Mello-Leitão, 1932:28, 1945:31; Werner, 1934:275; Franganillo, 1935:20, 1936:156; Moreno, 1938:192, 1939:107; Millot and Vachon, 1949:427; Waterman, 1950:168; Bücherl, 1959:269, 1967:112, 1969:768.

Didymocentrus (in part): Kraepelin, 1905:342; Birula, 1917*a*:59, 1917*b*:162, 191; Stahnke, 1968:273; Armas, 1973:1, 1974*a*:10, 1974*b*:5, 1976:1; Vachon, 1974:914; Williams and Lee, 1975:1.

Type species.—*Diplocentrus gundlachii* Karsch, 1880, new designation.

Etymology.—This name is a patronym for Dr. Mont A. Cazier, an excellent professor and dear friend.

Distribution.—Known only from Barbados, Cuba, and Brazil (?).

Diagnosis.—Three pairs of lateral eyes; metasomal segments subcylindrical, V with ventral transverse keel strong, arcuate; chelicera fixed finger shorter than chela width, movable finger approximately as long as chela length with distal external tooth moderately apposed to distal internal tooth; pedipalp femur deeper than wide; chela with ventral median carina directed towards external condyle of movable finger articulation, leaving a distinctly flat ventral face; manus with dorsal and external faces vestigially carinate to acarinate, if carinae are present digital keel is more prominent than either dorsal secondary or external secondary carinae; all legs with prolateral pedal spurs moderately developed; tarsomere I not bearing pores.

Cazierius gundlachii (Karsch), new combination
(Figs. 69, 72, 75, 77-80)

Diplocentrus gundlachii Karsch, 1880:407; Pocock, 1893*b*:394; Kraepelin, 1899:101 (part), 1901:270 (part ?); *nec* Moreno, 1938:194, pl. 16, figs. 6-8, pl. 17, fig. 2, 1939:113, pl. 15; *nec* Waterman, 1950:168; Kjellesvig-Waering, 1966:123.

Diplocentrus grundlachi (sic): Mello-Leitão, 1932:28 (part ?), 1945:31 (part ?); *nec* Bücherl, 1967:112, 1969:768 (part ?).

Didymocentrus gundlachii: Armas, 1973:3, 1974*a*:10, 1974*b*:5, 1976:7.

Diplocentrus whitei: Kraepelin, 1893:13 [part, *nec D. whitei* (Gervais, 1844*a*, 1844*b*)].

Diplocentrus orientalis Franganillo, 1935:20, fig. 1, 1936:156, fig. 83; Moreno, 1938:197, pl. 16, figs. 13-15, pl. 17, fig. 3, 1939:109, fig. 13.

Diplocentrus torrei Moreno, 1938:198, pl. 16, figs. 16-19, pl. 17, fig. 4, 1939:110, pl. 14.

Type data.—Lectotype male of *D. gundlachii* from "Trinidad et Santiago de Cuba, " no date (Dr. Gundlach); ZMHU. Lectotype male of *D. orientalis* from Estribaciones de la Sierra Maestra, Guantánamo, Provincia de Oriente, Cuba, no date (P. Franganillo); IZACC. Holotype male of *D. torrei* from Yumuri, Provincia de Oriente, Cuba, no date (no collector); Escuela de Ciencias Biologicas, Universidad de La Habana, Cuba.

Distribution.—Appears to be endemic to Provincia de Oriente, eastern Cuba.

Diagnosis.—Adults 27-33 mm. in total length; ochreous to ochreous fuscescent, vestigially infuscate, pectinal tooth count in males 8-8, in females 6-8 (mode 7); metasomal segments II and III wider than long, V with ventral median and ventral lateral carinae moderate to strong, granulose; chela vestigially carinate; tarsomere II spine formula 4/4: 5/5: 6/6: 6/6-7.

Description.—Measurements of adult male and female in Table 4. The following description is based on males; parenthetical statements refer to females.

Prosoma. Carapace ochreous to ochreous fuscescent, vestigially infuscate; median and submedian areas lustrous with sparse vestigial granulation, lateral margins shagreened (lustrous, smooth throughout). Anterior margin feebly emarginate, median notch rounded. Venter flavous to ochreous, sparsely setate, lustrous, smooth; sternum pentagonal.

Mesosoma. Tergites ochreous to ochreous fuscescent: I-VI shagreened (lustrous); VII tetracarinate; submedian keels present on distal submargin, weak to moderate, granulose; lateral carinae present on distal one-half, moderate to strong, granulose; intercarinae shagreened. Genital operculi flavous, paraboloid with feeble anteromedian emargination. Sternites ochreous, lustrous; stigmata elongate, three to four times longer than wide. Sternite VII tetracarinate; submedian keels present on distal one-half, weak (vestigial), subcrenate (smooth); lateral carinae present on distal two-thirds (one-third), weak to moderate, subcrenate (smooth).

Metasoma. Ochreous fuscescent to brunneous. Ventral submedian carinae on I-IV moderately strong, crenatogranulose; on I-III subparallel; IV feebly sinusoidal. Ventral lateral carinae on I-VI strong, crenate; on I feebly convergent distally, II subparallel, III feebly divergent distally, on IV moderately divergent distally. Lateral inframedian carinae on I-IV moderately strong, complete, crenate. Lateral supramedian carinae on I-IV moderate to strong, crenatogranulose. Dorsal lateral carinae moderate to strong, on I-II crenatogranulose, on III-IV granose. Intercarinae on I-IV lustrous; dorsally and laterally with sparse, small and vestigial granules. Segment V longer than pedipalp femur, slightly over one and one-half times longer than wide; ventral median keel strong, with large subconical granules; ventral lateral carinae moderate to strong, granulose; ventral transverse keel moderate to strong, with large subconical granules (Fig. 69); lateral median carinae present on basal two-thirds, weak, granulose; dorsal lateral carinae moderately strong, crenatogranulose to granose; anal arc rounded; anal subterminal keel moderate with numerous oblong granules, anal terminal keel vestigial, smooth; intercarinae lustrous, sparsely granulose; distal disc sparsely to moderately granulose. Telson: vesicle

dorsally smooth, bare; laterally and ventrally moderately granulose, densely setate.

Chelicera. Ochreous, vestigially infuscate dorsally (Fig. 72).

Pedipalp. Ochreous to ochreous fuscescent, orthobothriotaxia C. Femur basally subtriangular, distally subtrapezoidal in cross section; dorsal internal carina absent, dorsal and internal faces continuous with each other on one plane; dorsal external carina with basal one-half moderate to weak and sparsely granose, distally vestigial to obsolete; ventral external keel obsolete; ventral internal keel weak, granulose, curving dorsad distally; ventral face with internal margin subgranose, other areas smooth; external face smooth; dorsointernal face with sparse to moderately dense, medium-sized granules. Tibia (Fig. 75): dorsal internal carina obsolete, basal tubercle vestigial, granulose; dorsal median carina weak, smooth; dorsal external, external, and ventral external keels vestigial to obsolete; ventral median keel absent; ventral internal keel weak to vestigial, smooth; internal face shagreened; ventral face smooth, lustrous; dorsal and external faces vestigially reticulate, lustrous. Chela (Figs. 77-80): dorsal margin rounded, basally smooth, distally subgranose to granulose; digital keel vestigial, smooth; dorsal secondary and external secondary carinae obsolete; ventral external keel absent; ventral median keel strong, smooth, directed slightly externad of midpoint of movable finger articulation; ventral internal keel weak, smooth, directed towards internal condyle of movable finger articulation; internal face with ventrad keel vestigial, smooth, mesiad keel vestigial to obsolete, dorsad keel strong, granulose; internal face of chela feebly granose distally; ventral face lustrous, smooth; dorsal and external faces weakly to vestigially reticulate (smooth). Fixed finger base: dorsally moderately granulose; externally lustrous, smooth; internally lustrous, vestigially granulose, with keellike longitudinal rows of small granules paralleling articulation socket. Fixed finger very short, with dorsal margin feebly carinate. Fingers moderately to densely setate; dentate margins granulose, without distinct pattern, rows, or enlarged granules suggesting such condition.

Legs. Ochreous, with basal segments vestigially granulose.

Variation.—In connection with the sexual dimorphism indicated above, I examined a subadult gynandromorph of *C. gundlachii*, which represents the first ever reported for the order Scorpionida. Variability in pectinal teeth and tarsomere II spine counts is given in Tables 10 and 11, respectively.

Specimens examined.—CUBA: *Provincia de Oriente*: El Morro, Santiago de Cuba, 22 May 1972 (L. F. de Armas), 1 ♂, 1 ♀, 1 gynandromorph, 1 juv. ♂ (OFF); Playuela de Miel, Baracoa, 3 October 1973 (L. F. de Armas, C. Fundora, L. R. Hernandez), 3 ♀♀ (AMNH); Cuesta del Chivo, Maisi, no date (L. F. de Armas, C. Fundora, L. R. Hernandez), 3 ♀♀, 1 juv. ♀ (OFF).

Cazierius politus (Pocock), new combination
(Figs. 68, 71, 74, 81-84)

Diplocentrus politus Pocock, 1898:390.

Diplocentrus gundlachii: Kraepelin, 1899:101 (part)

Diplocentrus grundlachi (sic): Mello-Leitão, 1932:28 (part ?), 1945:31 (part ?); Bücherl, 1969:768 (part ?).

Type data.—Lectotype female, herewith designated, from "Brasil," no date (no collector; "purchased of Stevens"); BM, examined.

Distribution.—Known only by the lectotype and two paralectotypes from "Brasil." This species is closely related to the Cuban *C. gundlachii* (Karsch), under which it has been previously synonymized. From zoogeographical considerations, I find it difficult to accept Brasil as the correct type locality. *C. politus* might occur naturally on the island of Hispaniola, but I have not examined any specimens from that island.

Diagnosis.—Adults 30-35 mm. in total length; testaceous, vestigially infuscate; pectinal tooth count in male 7-8, in females 7-7; metasomal segments II and III wider than long; segment V with ventral median and ventral submedian carinae weak to moderate, subgranose to sparsely granulose; chela vestigially carinate to acarinate; tarsomere II spine formula 4/4: 5-6/5-6: 7/7: 7/7.

Description.—Measurements of lectotype female and paralectotype female and male in Table 4. The following description is based on females.

Prosoma. Carapace testaceous, with vestigial variegated fuscosity; lustrous, anterior submargin vestigially granulose. Anterior margin subgranose, shallowly emarginate, median notch broad and rounded. Venter ochreous to ochreous fuscescent, sparsely setate.

Mesosoma. Tergites testaceous with weak to vestigial, variegated fuscosity; tergites I-II smooth, lustrous; III-VI lustrous, vestigially granulose on posterior submargins, feebly carinate medially. Tergite VII lustrous, tetracarinate; submedian keels present on distal submargin, represented by two or three medium-sized granules; lateral carinae present on distal one-half, moderately strong, crenatogranulose; intercarinae smooth to vestigially granulose. Genital operculi ochreous, ellipsoidal. Sternites ochreous, lustrous, smooth; stigmata relatively small, elongate, about three times longer than wide. Sternite VII tetracarinate; submedian carinae present on distal one-third, weak to moderate, crenate; lateral carinae present on distal one-half, weak to moderate, coarsely crenate; median and submedian intercarinae smooth, lustrous; laterals shagreened.

Metasoma. Basal segments testaceous, distal segments and telson testaceo-ferrugineous; sparsely setate. Ventral submedian carinae on I-II strong, coarsely crenate, feebly convergent distally; III weak to moderate, crenate, subparallel; IV weak to vestigial, feebly crenate, slightly divergent distally. Ventral lateral carinae on I-II strong, coarsely crenate, feebly convergent distally; III moderate, crenate, subparallel; IV weak, crenate, feebly divergent distally. Lateral inframedian carinae on I moderately strong, feebly crenate, complete; II weak, subgranose, complete; III weak, feebly crenate, complete; IV vestigial, smooth. Lateral supramedian carinae on I-IV moderately strong, feebly crenate. Dorsal lateral carinae on I-IV moderately strong, crenate to crenatogranulose. Intercarinae on I-IV smooth, lustrous. Segment V longer than pedipalp femur, one and one-half times longer than wide; ventral median and ventral lateral carinae on basal one-half weak to vestigial, subgranose, distally

moderately strong, with medium-sized subconical granules; ventral transverse keel distinct, arcuate, granulose (Fig. 68); lateral median carinae vestigial to obsolete; dorsal lateral carinae weak, granulose; anal arc rounded, anal subterminal keel weak, with numerous small oblong granules, anal terminal keel vestigial to obsolete, smooth; intercarinae smooth, lustrous. Telson as wide as segment V; sparsely setate, with moderately dense vestigial granulation.

Chelicera. Chela ochreous, with vestigial variegated fuscosity; fingers uniformly ochreous fuscescent (Fig. 71).

Pedipalp. Brunneous to testaceous, orthobothriotaxia C. Femur in cross section subtriangular basally, trapezoidal distally; dorsal internal carina weak to vestigial, subgranose; dorsal external keel on basal one-half weak, subgranose, distally obsolete; ventral external keel obsolete; ventral internal keel weak, subgranose; ventral and external faces smooth, bare; internal face moderately granulose; dorsal face subangulose, with oblique keellike row of granules extending from basal external region to distal internal zone. Tibia (Fig. 74): dorsal internal keel obsolete, basal tubercle weak and granulose; dorsal median keel weak, smooth; dorsal external, external, ventral external, and ventral median carinae obsolete; ventral internal keel vestigial, smooth; dorsal, ventral, and external faces smooth, bare; internal face shagreened. Chela (Figs. 81-84): dorsal margin on basal one-half rounded and smooth, distal one-half vestigially carinate and subgranose; digital, dorsal secondary, external secondary, and ventral external carinae obsolete; ventral median keel strong, smooth, directed towards external condyle of movable finger articulation; ventral internal keel weak, smooth; internal face with ventrad and mesiad keels obsolete, dorsad keel weak and granulose. Manus with all faces smooth, lustrous. Fixed finger base: externally and dorsally lustrous, smooth; internally with feeble, granulose keel parallel to articulation socket. Fingers smooth, sparsely setate; dentate margins granulose, without distinct pattern, rows, or enlarged granules suggesting such condition.

Legs. Ochreous fuscescent, smooth, lustrous.

Variation.—The variability in pectinal tooth counts and tarsomere II spine counts appears in Tables 10 and 11, respectively.

Specimens examined.—"Brasil": no specific locality, no date (no collector; "purchased of Stevens"), 1 ♀ lectotype, 1 ♀, 1 juv. ♂ (BM).

Cazierius scaber (Pocock), new combination
(Figs. 76, 85-88)

Diplocentrus scaber Pocock, 1893*b*:396, 1898:392 (part); Kraepelin, 1893:15 (part), 1899:101 (part); Waterman, 1950:168 (part); *nec* Baerg, 1954:96, fig. 3; *nec* Bücherl, 1959:269; *nec* Torres and Heatwole, 1967:19.

Type data.—Lectotype female, herewith designated, from Barbados, no date (no collector); BM, examined.

Distribution.—Known only by the lectotype female from Barbados.

Diagnosis.—Adult female 31 mm. in total length; fuscous; pectinal tooth count 6-6; metasomal segment II wider than long, III as long as wide, V with

ventral median and ventral lateral carinae weak to moderate, granulose; chela vestigially carinate; tarsomere II spine formula 4/4: 5/5: 6/6: 7/7.

Description.—Measurements of lectotype in Table 4. The following description is based on the lectotype.

Prosoma. Carapace fuscous; shagreened to densely, minutely granulose throughout; anteriorly emarginate, median notch shallow and rounded. Venter fuscous, sparsely setate, moderately punctate.

Mesosoma. Tergites fuscous; I-VI shagreened, with scattered small and medium-sized granules at posterior submargins. Tergite VII tetracarinate; submedian carinae present on distal one-fourth, moderately strong, granulose; lateral carinae present on distal one-third, moderately strong, granulose; intercarinae shagreened, with sparse granules posterolaterally. Genital operculi testaceous, ellipsoid and considerably wider than prosomal sternum. Sternites fuscous; III-VI smooth to vestigially shagreened; stigmata elongate, about three times longer than wide. Sternite VII tetracarinate; submedian keels present on distal one-third, weak to moderate, subgranose; lateral keels present on distal one-half, moderately strong, subgranose; intercarinae shagreened.

Metasoma. Fuscous, sparsely setate. Ventral submedian carinae on I-II strong, coarsely granulose, parallel; III moderately strong, finely granose, subparallel; IV weak, finely granulose. Ventral lateral carinae on I-II strong, coarsely granose, subparallel; III moderately strong, with medium granulation, subparallel; IV weak to moderate, finely granulose, on basal two-thirds subparallel, distally moderately divergent. Lateral inframedian carinae on I strong, granose, complete; II moderate, granose, complete; III weak, subgranose, complete; IV vestigial, subgranose, complete. Lateral supramedian carinae on I-IV strong, finely granulose. Dorsal lateral carinae on I weak to moderate, granose, with distal granule enlarged; II-III strong, subgranose, with distal granule enlarged; IV strong, subgranose. Intercarinal spaces on segments I-IV shagreened to densely, minutely granulose. Segment V longer than pedipalp femur, slightly over two times longer than wide; ventral median carina weak to moderately strong, granulose; ventral transverse keel distinct, arcuate, granulose; ventral lateral carinae moderately strong, granulose; lateral median keels vestigial, subgranose; dorsal lateral carinae weak to moderate, smooth; anal arc rounded, anal subterminal carina moderate, with numerous small oblong granules, anal terminal keel vestigial, smooth; intercarinae shagreened, ventral distal disc with sparse small granulation. Telson: narrower than segment V; laterally and ventrally densely granulose, moderately setate.

Chelicera. Testaceous, with normal generic dentition.

Pedipalp. Fuscous, orthobothriotaxia C. Femur subtriangular in cross section dorsal internal carina present on basal margin, vestigial, subgranose; dorsal external carina on basal one-half strong, granulose, distally weak to vestigial, subgranose to smooth; ventral external keel obsolete; ventral internal keel moderately strong, coarsely granose, curving dorsad distally; ventral face shagreened, moderately granulose; external face shagreened; dorsointernal face shagreened, moderately granulose. Tibia subtriangular in cross section

(Fig. 76); dorsal internal keel obsolete, basal tubercle weak, subgranose; dorsal median keel strong, smooth; dorsal external keel weak to moderate, smooth; external carina obsolete; ventral external keel moderate, smooth; ventral median keel obsolete; ventral internal keel weak, subgranose; ventral face vestigially granulose, punctate, with punctations often assuming reticular pattern; internal face shagreened; dorsal and external faces densely punctate. Chela (Figs. 85-88); right chela missing trichobothrium V_3; dorsal margin basally feebly subcarinate and smooth, medially rounded and smooth, distally and at fixed finger base strongly carinate and subgranose; digital keel basally weak and smooth, medially obsolete, distally and at fixed finger base moderate to strong, smooth, continuing for approximately one-half of fixed finger length; dorsal secondary, external secondary, and ventral external keels obsolete; ventral median keel strong, smooth; ventral internal keel moderately strong, smooth; internal face with ventrad and mesiad keels obsolete, dorsad keel vestigial to obsolete, subgranose; internal face densely punctate; ventral face sparsely to moderately punctate; dorsal and external faces with moderately dense punctations arranged in reticular pattern. Fixed finger base: dorsally and externally moderately punctate; internally moderately granulose, sparsely setate. Fingers moderately setate and punctate; dentate margins granulose, without distinct pattern, rows, or enlarged granules suggesting such condition.

Legs. Fuscous. Femora and tibiae shagreened.

Comparative Descriptions

The genus *Cazierius* is interesting because it has a rather disjunct distribution and because it is apparently ancestral to the genus *Oieclus* Simon. *Cazierius* and *Oieclus* share the presence of a distinctly arcuate ventral transverse keel on metasomal segment V, a pedipalp femur that is deeper than wide, and a pedipalp chela that is vestigially carinate to acarinate. *Oieclus* can be recognized by the presence of only two pairs of lateral eyes, the absence of prolateral pedal spurs on all legs, the occurrence of a metasomal segment III that is longer than wide, and by its cheliceral morphology.

Cazierius politus, from Brasil (?), can be recognized by its higher pectinal tooth count and tarsomere II spine formula. *C. gundlachii*, from Cuba, shows affinities to *C. politus* in pectinal tooth counts and in having the fixed finger of the pedipalp chela shorter than the width of metasomal segment I. *C. gundlachii* differs from *C. politus* in having a lower tarsomere II spine formula. *C. scaber*, from Barbados, differs from the other members of the genus by a lower pectinal tooth count, an intermediate tarsomere II spine formula, and the fixed finger of the pedipalp chela longer than the width of metasomal segment I.

Compared with *Diplocentrus*, *Cazierius* can be separated from *Diplocentrus* on the basis of femoral and cheliceral proportions. In *Cazierius*, the pedipalp femur is deeper than wide and the fixed and movable fingers of the chelicera are shorter than the chela width and length, respectively. In species of *Diplocentrus* with femoral proportions similar to those for *Cazierius*, the fixed and

movable fingers of the chelicera are longer than the chela width and length, respectively.

Oieclus Simon

Diplocentrus: Becker, 1880:142 (*nec Diplocentrus* Peters, 1861); Kraepelin, 1893:12 (part).
Oïclus Simon, 1880:397.
Oiclus: Pocock, 1893*a*:308, 1893*b*:396, 1898:392; Laurie, 1896:128.
Oeclus: Kraepelin, 1899:98; Birula, 1917*a*:59, 1917*b*:162; Lampe, 1918:197; Werner, 1934:275; Waterman, 1950:168; Stahnke, 1968:276, 1970:305; Vachon, 1974:914.

Type species.—*Oieclus purvesii* (Becker), by monotypy.

Distribution.—Known from the following Leeward Islands in the Lesser Antilles: Antigua, Barbuda, Iles des Saintes (Guadeloupe), Montserrat, Nevis, Saba, St. Kitts.

Diagnosis.—Two pairs of lateral eyes; metasomal segments subcylindrical, V with ventral transverse keel strong, arcuate; chelicera with fixed finger as long as chela width, movable finger as long as chela length with distal external tooth not closely apposed to distal internal tooth; pedipalp femur deeper than wide; chela with ventral median keel directed towards external condyle of movable finger articulation, leaving a distinctly flat ventral face; manus without carinae on dorsal and external faces; legs lacking prolateral pedal spurs; tarsomere I not bearing pores.

Compared with *Diplocentrus*, *Oieclus* can be recognized readily by the absence of prolateral pedal spurs, which are always present in *Diplocentrus*.

Remarks.—I have corrected the spelling of the generic name from *Oïclus* to *Oieclus* in accordance with the rulings of the International Code of Zoological Nomenclature (Art. 32c).

Oieclus is a monotypic genus, and *Oieclus purvesii* (Becker) is a polytypic species that has been collected in seven small islands. Among these geographically isolated populations, two subspecies and one hybrid population are recognized as follows: *O. p. purvesii* (Becker), tarsomere II spine formula equal on both sexes at 3/3: 4/4: 5/5: 5/5; *O. p. sabae*, tarsomere II spine formula equal on both sexes at 4/3-4: 5/4: 5/5: 5/6; *O. p. purvesii* × *O. p. sabae* (hybrids), tarsomere II spine formula showing sexual dimorphism: males, 4/3: 4-5/4: 5/5: 5/5; females, 3/4: 4/4: 5/5: 5/5.

Oieclus purvesii purvesii (Becker), new combination
(Figs. 70, 73, 89-92)

Diplocentrus purvesii Becker, 1880:142, pl. 3, fig. 2.
Oïclus purvesii: Simon, 1880: 397.
Oiclus purvesii: Pocock, 1893*b*:396, 1898:392.
Oeclus purvesii: Kraepelin, 1899:98; Lampe, 1918:197; Werner, 1934:275; Waterman, 1950:168; Stahnke, 1970:305; Vachon, 1974:915.
Diplocentrus whitei: Kraepelin, 1893:13 [part, *nec Diplocentrus whitei* (Gervais, 1844)].

Type data.—Holotype, subadult male from Antigua, no date (M. Purves); MNd'HN, examined.

Distribution.—This subspecies is known from Antigua, Barbuda, Iles des Saintes (Guadeloupe), Montserrat, and Nevis.

Diagnosis.—Pectinal tooth count in males 5-8 (mode, 7), in females 5-7 (mode, 6); tarsomere II spine formula 3/3: 4/4: 5/5: 5/5.

Description.—Measurements of holotype male, adult male and adult female topotypes in Table 5. The following description is based on males; parenthetical statements refer to females.

Prosoma. Carapace brunneous with distinct fuscous pattern: anteromedially vestigially granulose, posteromedian and submedian regions lustrous, laterally vestigially shagreened (lustrous throughout). Anterior margin shallowly emarginate, median notch rounded. Venter ochreous, sparsely setate. Sternum pentagonal, as long as wide.

Mesosoma. Tergites brunneous, with distinct variegated fuscosity; shagreened, with posterior submargins sparsely granulose (lustrous). Tergite VII tetracarinate; submedian keels short, weak to vestigial, minutely granulose; lateral keels weak to moderate, granulose. Genital operculi flavous, ellipsoidal. Sternites ochreous; III-VI lustrous, vestigially punctate; stigmata elongate. Sternite VII tetracarinate; submedian keels present on distal one-third, vestigial, smooth (one-half, weak, granulose); lateral keels present on distal one-half, weak, smooth (two-thirds, moderate, coarsely granulose).

Metasoma. Brunneous, darkening slightly on distal segments; vestigially infuscate along carinae and on distal regions of intercarinae. Ventral submedian carinae on I-II weak, subcrenate, subparallel to feebly convergent distally (strong, coarsely granulose); III vestigial (weak, granose); IV obsolete. Ventral lateral carinae on I strong, crenate (granulose), weakly convergent distally; II moderate, subcrenate, feebly convergent distally; III vestigial (weak to moderate, granulose), parallel; IV obsolete. Lateral inframedian carinae on I weak to vestigial, subcrenate, complete; II-III obsolete except for short, subdistal, weak, smooth region; IV obsolete. Lateral supramedian carinae on I weak to moderate, subgranose; II-III weak to vestigial, smooth except for short granular section distally; IV weak to vestigial, smooth. Dorsal lateral carinae on I-II weak, moderately granulose; III-IV weak to moderately strong, feebly granulose. Intercarinal spaces on segments I-IV smooth. Segment V considerably longer than pedipalp femur; ventral median and ventral lateral carinae weak to moderate, with small and medium-sized, irregularly spaced granules (Fig. 70); ventral transverse keel moderately strong, granulose, arcuate; lateral median carinae vestigial, smooth to feebly subgranose; dorsal lateral keels weak, subgranose; intercarinae ventrally and dorsally smooth and lustrous, laterally sparsely punctate and vestigially rugose; anal arc circular, anal subterminal keel strong bearing oblong granules, anal terminal keel vestigial and subgranose to smooth. Telson granulose ventrally and laterally.

Chelicera. Ochreous; dorsally chela and fingers with diffuse to moderate fuscosity (Fig. 73).

Pedipalp. Orthobothriotaxia C. Femur ochreous fuscescent, diffusely infuscate; in cross section subtriangular basally, quadrangular distally; dorsal

internal carina indistinct; dorsal external keel on basal one-half moderately strong and coarsely granulose, distally vestigial to obsolete and subgranose; ventral internal keel weak, short, granose; ventral external keel vestigial basally, obsolete medially and distally; ventral face moderately granulose, with small and minute granules interspersed; external face smooth, lustrous; dorsointernal region coarsely granulose. Tibia (Fig. 92): brunneous, external face with diffuse reticulated fuscosity; dorsal internal keel obsolete, basal tubercle weak, granulose; dorsal median keel weak, subgranose; dorsal external keel obsolete; external keel basally obsolete, distally vestigial and smooth; ventral external carina weak to vestigial, smooth; ventral median keel obsolete; ventral internal keel weak to moderate, subgranose; ventral face smooth to vestigially punctate, lustrous; external and dorsal faces smooth, lustrous; internal face shagreened to densely, minutely granulose. Chela (Figs. 89-91): brunneous with diffuse fuscosity on dorsal and external faces; dorsal margin strongly carinate, coarsely granulose; digital, dorsal secondary, external secondary, and ventral external carinae obsolete; ventral median keel strong, smooth; ventral internal keel vestigial, smooth; internal face dorsally coarsely granulose, medially and basally smooth to feebly punctate, distally through fixed finger base moderately granulose; ventral face flat, moderately punctate; dorsal and external faces weakly to vestigially reticulate, scabrose (manus lustrous, vestigially punctate). Fingers proportionately very short, moderately setate. Movable finger dentate margin: basal one-half with indistinct pattern, granules randomly placed two to three abreast; distal one-half with distinct median longitudinal row of small granules and numerous, subequal supernumerary granules on both sides.

Legs. Ochreous, with vestigial uniform fuscosity.

Variation.—Variability in pectinal teeth and tarsomere II spine counts in Tables 10 and 11, respectively.

Specimens examined.—ANTIGUA: no date (M. Purves), 1 ♂ holotype (MNd'HN); Reed Point, Morris Bay, 15 July 1963 (E.N.K.-Waering), 10 ♂♂, 2 ♀♀, 9 juv. ♂♂, 4 juv. ♀♀ (ENKW), 1 ♂, 1 ♀ (IB); 8 October 1963 (E.N.K.-Waering), 1 ♀, 1 juv. ♂, 1 juv. ♀ (ENKW); Dickinson Bay, 15 June 1963 (E.N.K.-Waering), 1 ♂, 1 juv. ♀ (AMNH), 5 ♂♂ (ENKW); *St. George Parish*: St. George church graveyard, 26 September 1963 (E.N.K.-Waering), 1 ♂ (ENKW). BARBUDA: Highlands, Dark Cave (sinkhole), 6 July 1955 (P. W. Hummelinck), 1 juv. ♂ (ZLRU); Goo Darbj's Cave, 10 July 1955 (P. W. Hummelinck), 1 juv. ♂ *exuvium* (OFF). ILES DES SAINTES: Terre-de-Haute, 6 February 1963 (P. W. Hummelinck), 1 ♀ (ZLRU). MONTSERRAT: Plymouth, Rocky Point, Coconut Hill Hotel, 10 October 1966 (R. Martinez, A. Guerra), 3 ♂♂ (ENKW); South Montserrat Island, November 1966 (F. D. Bennett), 1 ♀ (ENKW). NEVIS: Indian Castle, 18 April 1967 (C. D. Bennett), 2 ♂♂, 2 ♀♀ (ENKW).

Oieclus purvesii sabae, new subspecies

Type data.—Holotype male from road to Bottom (150 meters), Saba, 6 October 1963 (P. W. Hummelinck); ZLRU, Utrecht.

Etymology.—Named after the island of Saba.

Distribution.—Known only from the island of Saba, Lesser Antilles.

Diagnosis.—Pectinal tooth count in males 7, in females 6-7; tarsomere II spine formula 4/3-4: 5/4: 5/5: 5/6.

Description.—Measurements of holotype and paratype, adult males in Table 5. *Oieclus purvesii sabae* is very similar to the nominate subspecies, differing significantly only in the characters indicated in the respective diagnoses and in distribution.

Variation.—The variability in number of lateral eyes appears in Table 9, that of pectinal teeth in Table 10, and that of tarsomere II spine counts in Table 11.

Specimens examined.—SABA: road to Bottom (150 meters), 6 October 1963 (P. W. W. Hummelinck), 1 ♂ holotype and 1 ♂, 1 ♀, 2 juv. ♂♂, 2 juv. ♀♀ (ZLRU).

Oieclus p. purvesii × *Oieclus p. sabae*

The island of Saint Kitts, geographically interposed between Nevis and Saba, is inhabited by an interesting population of *Oieclus purvesii.* The males of the Saint Kitts population can be separated easily from the males of the two described subspecies, and the characters that make this male population unique are intermediate, in their degree of differentiation, between those that separate *O. p. purvesii* and *O. p. sabae.* The tarsomere II spine formula of the Saint Kitts males is 4/3: 4-5/4: 5/5: 5/5. Males from Saint Kitts resemble the nominate subspecies on the spination of the third and fourth pairs of legs, but are more similar to *O. p. sabae* on the spination of the first pair of legs. The Saint Kitts population bears a spination pattern on the second pair of legs that is intermediate between that found in *O. p. purvesii* and *O.p. sabae* (Table 11).

Females from Saint Kitts, on the other hand, are indistinguishable from the nominate subspecies and have a tarsomere II spine formula of 3/3: 4/4: 5/5: 5/5 (Table 11).

The population of *Oieclus purvesii* from St. Kitts, therefore, presents an interesting taxonomic problem, which is compounded by the fact that it is the first, and only, known population of diplocentrid scorpions showing sexual dimorphism with respect to the tarsomere II spine formula. Although the males can be morphologically separated from the two described subspecies, the females are morphologically similar to the nominate subspecies, precluding the recognition of the St. Kitts population as a distinct subspecies. Likewise, the distinctiveness of the males precludes the inclusion of the St. Kitts population with either one of the described subspecies. Thus, I consider the St. Kitts specimens as belonging to a hybrid population between *O. p. purvesii* and *O. p. sabae.*

Specimens examined.—ST. KITTS: Brimstone Fort Hill, 18 August 1966 (T. H. S. Aitken), 1 ♂ (ENKW); Brimstone, 21 June 1967 (F. D. Bennett, K. Laurie, J. Phillips), 3 ♂♂, 3 ♀♀ (ENKW); Old Road Bay, April 1969 (F. D. Bennett), 2 ♀♀ (ENKW).

Heteronebo Pocock

Heteronebo Pocock, 1899:7, 1903:202; Kraepelin, 1905:342; Birula, 1917*a*:58, 1917*b*:162, 195; Werner, 1934:275; Millot and Vachon, 1949:427; Rosin and Shulov, 1963:548; Francke, 1977*a*:95.

Diplocentrus: Pocock, 1893*b*:393 (part); Kraepelin, 1893:12 (part), 1899:99 (part); Werner, 1934:275 (part); Moreno, 1938:192 (part), 1939:107 (part); Mello-Leitão,

1945:32 (part ?); Waterman, 1950:168 (part); Baerg, 1954:96; Torres and Heatwole, 1967:19; Bücherl, 1969:768 (part).

Didymocentrus: Armas, 1973:1 (part), 1976:1 (part); Vachon, 1974:914 (part); Williams and Lee, 1975:1 (part ?).

Type species.—*Heteronebo granti* Pocock, original designation.

Distribution.—The genus *Heteronebo* is known from the following Caribbean islands: Cuba, Grand Cayman, Jamaica, Martinique, and Puerto Rico. The original description is based on specimens from Abd-el-Kuri, Peoples Democratic Republic of Yemen, a doubtful locality (Francke, 1977*a*).

Diagnosis.—Three pairs of lateral eyes; metasomal segments subcylindrical, segment V without ventral transverse keel; chelicera with fixed finger shorter than chela width, movable finger shorter than chela length with distal external tooth moderately to closely apposed to distal internal tooth; pedipalp femur deeper than wide on all but one species (*H. granti*); chela with ventral median carina straight to feebly arcuate distally, directed towards external one-half of movable finger articulation (usually towards external condyle), leaving a distinctly flat ventral face; if carinae are present on dorsal and external faces of manus, the digital keel is more prominent than either the dorsal secondary or external secondary carinae; prolateral pedal spurs usually present on all legs, always present on at least two pairs of legs; tarsomere I not bearing pores.

Heteronebo granti Pocock
(Figs. 93, 107, 115-118)

Heteronebo granti Pocock, 1899:7, 1903:202; Werner, 1934:275; Rosin and Shulov, 1963:548; Francke, 1977*a*:99.

Type data.—Lectotype female from the island of "Abd-el-Kuri, Peoples Democratic Republic of Yemen," 5 December 1898 (W. R. O. Grant and H. O. Forbes); BM, examined.

Distribution.—Known only from lectotype and one paralectotype female from "Abd-el-Kuri, P. D. R. Yemen." Elsewhere (Francke, 1977*a*), I have expressed my doubts about the accuracy of the type locality data; this species probably occurs on one of the Greater Antillean islands.

Diagnosis.—Adults (?) 40-45 mm. in total length; ochreous, diffusely to moderately infuscate; pectinal tooth count in females 8-8, male unknown; metasomal segment II approximately as long as wide, III longer than wide; segment V with ventral median and ventral lateral carinae well defined, with medium-sized subconical granules; pedipalp femur wider than deep, chela moderately to strongly carinate; tarsomere II spine formula 5/5: 5-6/6: 6/6: 6/6.

Description.—Measurement of lectotype in Table 6. The following description is based on females; males are unknown.

Prosoma. Carapace ochreous with diffuse variegated fuscosity; medially smooth, laterally shagreened; anterior margin moderately emarginate, median notch rounded. Venter ochroleucous, sparsely setate, smooth.

Mesosoma. Tergites ochreous to ochroleucous, infuscate at anterior submargin; I-VI smooth, lustrous. Tergite VII tetracarinate; submedian carinae

present on distal one-fifth, moderately strong, subgranose; lateral keels present on distal one-third, strong, subgranose; median intercarina smooth, submedian and lateral intercarinae shagreened. Genital operculi ochroleucous, paraboloid. Sternites ochroleucous; smooth, bare; stigmata relatively small and elongate, about three times longer than wide. Sternite VII with submedian keels absent, lateral keels vestigial to obsolete and smooth.

Metasoma. Ochreous, distinctly infuscate; intercarinae with moderate to dense variegated fuscosity, carinae uniformly infuscate; fuscosity density and extent increasing distally between and within segments. Ventral submedian carinae on I-II obsolete; III-IV vestigial, smooth, parallel. Ventral lateral carinae on I weak to moderate, smooth, parallel; II-III weak, smooth, slightly divergent distally; IV weak to moderate, subgranose, moderately divergent distally. Lateral inframedian carinae on I weak to moderate, smooth, complete; II weak to vestigial, smooth, complete; III vestigial, smooth, complete; IV obsolete. Lateral supramedian carinae on I-III moderately strong, smooth, distally abruptly ending in sharp tubercle; IV moderately strong, smooth. Dorsal lateral carinae on I-IV weak, smooth to subcrenate, distally abruptly ending in sharp tubercle. Intercarinae on segments I-IV smooth, except for dorsals on all segments and laterals on IV sparsely to moderately shagreened. Segment V longer than pedipalp femur, slightly less than two times longer than wide; ventral median keel strong, granulose, distally bifurcate and not reaching anal arc (Fig. 93); ventral lateral carinae strong, granulose; lateral median carinae present on basal one-half, vestigial, subgranose; dorsal lateral carinae moderately strong, subgranose; anal arc rounded, anal subterminal keel moderate, with numerous small, oblong granules, anal terminal keel weak, subdentate to smooth; ventral intercarinae smooth, laterals and dorsal moderately shagreened. Telson densely infuscate, with paired lateral-subdorsal and ventral-submedian narrow, longitudinal ochreous bands; sparsely setate, sparsely granulose.

Chelicera. Ochroleucous, normal generic dentition.

Pedipalp. Orthobothriotaxia C. Femur: ochreous with sparse to moderately dense variegated fuscosity; subquadrate in cross section, slightly wider than deep; dorsal internal keel weak, coarsely granulose; dorsal external keel on basal one-third strong and granulose, distally moderate with small granules; ventral external keel present on basal one-fifth, weak, subgranose; ventral internal carina strong, coarsely granulose, curving dorsad distally; ventral face with inner margin weakly granulose; external face with weak, median longitudinal keel distally; dorsal face flat, basally with poorly defined median longitudinal row of large and medium granules; internal face shagreened. Tibia (Fig. 107): ochreous with internal face and carinae moderately infuscate; dorsal internal keel obsolete, basal tubercle weak, granose; dorsal median keel strong, smooth; dorsal external keel weak to vestigial, smooth; external keel vestigial, smooth; ventral external carina strong, smooth; ventral median keel obsolete; ventral internal keel moderately strong, smooth; internal face shagreened; dorsal, external, and ventral faces smooth, lustrous. Chela (Figs. 115-118):

ochreous fuscescent with carinae densely and uniformly infuscate, intercarinae with diffuse variegated fuscosity, fingers moderately and uniformly infuscate; dorsal margin weakly to vestigially carinate, subgranose; digital carina very strong, smooth, extending through fixed finger base; dorsal secondary keel weak, smooth; external secondary keel basally and distally weak to vestigial, medially obsolete; ventral external keel absent; ventral median keel strong, smooth; ventral internal keel present on basal one-third to one-half, weak to vestigial, smooth; internal face with ventrad and mesiad keels vestigial and smooth to subgranose, dorsad keel weak to moderate and granulose. Dorsal, external, and ventral faces of chela smooth, bare; internal face dorsally sparsely granulose, medially and ventrally smooth. Fixed finger base: dorsally and externally shagreened; internally shagreened, with longitudinal row of small and medium-sized granules paralleling articulation socket. Fingers sparsely setate and punctate; dentate margins granulose, without distinct pattern, rows, or enlarged granules suggesting such condition.

Legs. Ochroleucous. Femora vestigially shagreened to granulose. Prolateral pedal spurs moderate on all legs.

Variation.—The immature paralectotype female does not differ significantly from the lectotype. Variability in pectinal teeth and tarsomere II spine counts in Tables 10 and 11, respectively.

Remarks.—Elsewhere (Francke, 1977*a*), I mistakenly considered the lectotype to be an immature female, a decision based on intergeneric comparisons. The revision of the genus presented herein has made intrageneric comparisons possible for the first time, and I now consider the lectotype to be an adult to subadult specimen.

Specimens examined.—YEMEN: Abd-el-Kuri, 5 December 1898 (W. R. O. Grant, H. O. Forbes), 1 ♀ lectotype, 1 juv. ♀ (BM).

Heteronebo elegans, new species
(Figs. 94, 102, 108, 119-122)

Type data.—Holotype female from Winfield Hall, St. Thomas Parish, Jamaica, 17-20 May 1952 (N. Perry); ENKW collection.

Etymology.—From the latin *elegan* meaning elegant or fine. The name is in reference to the morphological gracefulness of the species.

Distribution.—Known only from St. Thomas Parish, Jamaica, Greater Antilles.

Diagnosis.—Adults 35 mm. in total length; ochreous, moderately infuscate; pectinal tooth count in females 6-6, male unknown; metasomal segment II approximately as long as wide, III longer than wide, V with ventral median and ventral lateral carinae moderately strong with medium-sized subconical granules; pedipalp femur deeper than wide; chela moderately carinate, as long or longer than twice its width; tarsomere II spine formula 4/4: 5/5: 6/6: 6/6.

Description.—Measurements of holotype and paratopotype females in Table 6. The following description is based on females; males are unknown.

Prosoma. Carapace ochreous; anterior and posterior submargins moderately and uniformly infuscate, other areas with diffuse variegated fuscosity; essentially smooth, with sparse minute granules submedially; anterior margin moderately emarginate, median notch rounded. Venter flavous, sparsely setate, smooth and lustrous.

Mesosoma. Tergites ochreous with moderately dense, variegated fuscosity; I-VI smooth, lustrous. Tergite VII vestigially shagreened, tetracarinate; submedian keels represented by few small granules at distal submargin; lateral carinae present on distal one-half, weak to moderately granulose. Genital operculi flavous, paraboloid. Sternites flavous; III-VI smooth; stigmata relatively small, about three and one-half times longer than wide. Sternite VII tetracarinate; submedian keels present on middle one-third, vestigial, subgranose; lateral keels present on distal two-thirds, weak, granulose; intercarinae smooth.

Metasoma. Ochreous, diffusely infuscate along carinae and distally on segments IV-V. Ventral submedian carinae on I-II moderately strong, granulose, parallel; III-IV weak, granulose, subparallel. Ventral lateral carinae on I-II strong, granulose, parallel; III-IV moderate, granulose, feebly divergent distally. Lateral inframedian carinae on I-II strong, complete, granulose; III-IV moderate to weak, granulose, complete. Lateral supramedian carinae on I-IV moderate to strong, granulose. Dorsal lateral carinae on I weak, subgranose; II-IV moderate, granulose. Intercarinae on I-IV; dorsals shagreened to densely, minutely granulose; ventrals and laterals smooth. Segment V longer than pedipalp femur, slightly less than two times longer than wide; ventral median keel moderately strong and granulose, with strong subdistal bifurcation (Fig. 94), possibly representing remnants of ventral transverse keel; ventral lateral carinae strong, granulose; lateral median keels present on basal two-thirds to three-fourths, weak to moderate, granulose; dorsal lateral carinae moderately strong, minutely granulose; anal arc rounded, anal subterminal keel moderately strong with numerous small subconical granules, anal terminal keel vestigial and smooth; dorsal intercarinae vestigially granulose, ventrals and laterals smooth. Telson moderately granulose, sparsely setate.

Chelicera. Flavous (Fig. 102).

Pedipalp. Ochreous, orthobothriotaxia C. Femur with moderately dense fuscosity; trapezoidal in cross section; dorsal internal keel vestigial, granulose; dorsal external keel on basal one-half strong and sparsely granose, distally vestigial and smooth; ventral external keel obsolete; ventral internal keel moderate, granulose; ventral face smooth, bare; external face smooth, sparsely setate; internal face shagreened, with median longitudinal keellike row of medium-sized granules; dorsal face obtusely angulose to internal face, shagreened, with median longitudinal array of small and medium-sized granules. Tibia (Fig. 108) vestigially infuscate; dorsal internal keel obsolete, basal tubercle weak and subgranose; dorsal median keel moderate, smooth; dorsal external keel vestigial, smooth; external keel obsolete; ventral external keel weak, smooth; ventral median keel obsolete; ventral internal keel weak to

moderate, subgranose; ventral face lustrous, sparsely punctate; internal face shagreened; dorsal and external faces smooth, lustrous. Chela (Figs. 119-122): fixed finger base with diffuse fuscosity; dorsal margin on basal one-half rounded and smooth, distally (through fixed finger base) subcarinate and subgranose; digital keel moderately strong, smooth, extending through length of fixed finger; dorsal secondary keel weak, smooth, merging with dorsal marginal keel at fixed finger base; external secondary keel weak to vestigial, smooth, ending gradually at fixed finger base; ventral external keel obsolete; ventral median keel moderately strong, smooth; ventral internal keel weak, smooth; internal face with ventrad and mesiad keels vestigial and subcrenate, dorsad keel weak to moderate and granulose; ventral face flat, smooth; internal face smooth except for dorsal submargin with moderate granulation; external face sparsely, vestigially punctate; dorsal face vestigially reticulate, ridges punctate. Fixed finger base dorsally and externally sparsely punctate, internally with longitudinal keellike row of granules parallel to articulation socket. Fingers sparsely setate; dentate margins granulose, without distinct pattern, rows, or enlarged granules suggesting such condition.

Legs. Flavous, diffusely infuscate. Prolateral pedal spurs small, present on all legs.

Variation.—This species is known only from two females with the same number of pectinal teeth (Table 10) and tarsomere II spine counts (Table 11).

Specimens examined.—JAMAICA: *St. Thomas Parish*: Winfield Hall, 17-20 May 1952 (N. Perry), 1 ♀ holotype, 1 juv. ♀ (ENKW).

Heteronebo forbesii Pocock
(Figs. 95, 109, 123-126)

Heteronebo forbesii Pocock, 1899:8, 1903:203; Francke, 1977*a*:104.

Type data.—Lectotype female from the island of Abd-el-Kuri, Peoples Democratic Republic of Yemen, 5 December 1898 (W. R. O. Grant and H. O. Forbes); BM, examined.

Distribution.—Known only from lectotype, one paralectotype female, and one juvenile male, presumably from Abd-el-Kuri, P.D.R. Yemen. Elsewhere (Francke, 1977*a*), I have expressed my doubts about the accuracy of the type data; this species probably occurs on one of the Greater Antillean islands.

Diagnosis.—Adults (?) 40 mm. in total length: ochreous, moderately infuscate; pectinal tooth count in male 9-10, in females 8-9 (mode, 8); metasomal segments II and III longer than wide, segment V with ventral median and ventral lateral carinae moderate, with medium-sized subconical granules; pedipalp femur deeper than wide, chela vestigially carinate; tarsomere II spine formula 5/5: 5/5: 6/6: 6/6.

Description.—Measurements of lectotype in Table 6. The following description is based on females; adult males are unknown.

Prosoma. Carapace ochreous, distinctly infuscate; posterolaterally shagreened, other regions smooth; anterior margin moderately emarginate, median notch rounded. Venter ochroleucous, sparsely setate, smooth.

Mesosoma. Tergites ochreous with vestigial, variegated fuscosity; I-VI sparsely shagreened. Tergite VII tetracarinate; submedian keels present on distal one-fifth, weak, smooth; lateral keels present on distal one-fourth, weak to moderate, smooth; intercarinae smooth. Genital operculi ochroleucous, paraboloid. Sternites ochreous; III-VI smooth, bare; stigmata relatively small, about three times longer than wide. Sternite VII tetracarinate; submedian keels present on distal one-third, vestigial, smooth; lateral carinae present on distal one-fourth, vestigial, smooth; intercarinae smooth.

Metasoma. Ochreous, distinctly infuscate; I-II vestigially fuscous throughout; III-V with diffuse, variegated fuscosity. Ventral submedian carinae on I-II weak, smooth, subparallel; III weak to vestigial, smooth, parallel; IV vestigial. Ventral lateral carinae on I weak, smooth, subparallel; II moderately strong, smooth, feebly arcuate and biconvex with each other; III-IV weak, smooth, slightly divergent distally. Lateral inframedian carinae on I-II vestigial, smooth; III-IV obsolete. Lateral supramedian carinae on I-II weak, smooth; III-IV moderately strong, smooth. Dorsal lateral carinae on I-IV vestigial, smooth. Intercarinae on I-IV smooth. Segment V longer than pedipalp femur, less than two times longer than wide; ventral median keel moderately strong and granulose, tetrafurcate subdistally, with outermost branches possibly representing remnant ventral transverse keel (Fig. 95); ventral lateral carinae moderately strong, granulose; lateral median carinae present on basal one-third to one-half; vestigial, subgranose; dorsal lateral carinae moderately strong, feebly granulose; anal arc rounded, anal subterminal keel moderate, with numerous small oblong granules, anal terminal keel vestigial and dentate; intercarinae smooth. Telson sparsely setate, vestigially granulose.

Chelicera. Ochreous, with normal generic dentition.

Pedipalp. Ochreous, vestigially infuscate; orthobothriotaxia C. Femur subtrapezoidal in cross section; dorsal internal carina vestigial, granulose; dorsal external keel on basal two-thirds strong and coarsely granulose, distally vestigial to obsolete; ventral external keel obsolete; ventral internal carina moderately strong, coarsely granulose; ventral and external faces smooth; dorsal face moderately to strongly convex, merging with internal face without abrupt angular or carinal division; dorsointernal face moderately granulose. Tibia (Fig. 109): dorsal internal keel obsolete, basal tubercle weak to vestigial and subgranose; dorsal median carina strong, smooth; dorsal external, and external carinae obsolete; ventral external keel vestigial to obsolete, smooth; ventral internal keel weak, subgranose; internal face shagreened; dorsal, external, and ventral faces smooth. Chela (Figs. 123-126): dorsal margin vestigially carinate, on basal two-thirds smooth, distally and on fixed finger base subgranose; digital keel basally and distally vestigial and smooth, medially obsolete; dorsal secondary, external secondary, and ventral external carinae obsolete; ventral median keel weak to moderate, smooth, feebly arcuate; ventral internal keel present on basal submargin, weak to vestigial, smooth; internal face with keels obsolete; dorsal face vestigially shagreened; external, ventral, and internal faces smooth. Fixed finger base shagreened. Fingers sparsely setate; dentate margins granulose.

Legs. Ochreous to ochroleucous, smooth. Prolateral pedal spurs moderate on all legs.

Variation.—The variability in pectinal teeth and tarsomere II spine counts is given in Tables 10 and 11, respectively.

Remarks.—As in the case of *H. granti*, I am now inclined to believe that the lectotype and paralectotype of *H. forbesii* are actually adult specimens rather than immatures.

Specimens examined.—YEMEN: Abd-el-Kuri, 5 December 1898 (W. R. O. Grant, H. O. Forbes), 1 ♀ lectotype, 1 ♀, 1 juv. ♂ (BM).

Heteronebo portoricensis, new species
(Figs. 96, 103, 110, 127-130)

Diplocentrus scaber: Torres and Heatwole, 1967:19 (misidentification).

Type data.—Holotype female from near Tamarindo (2 meters), Guanica Forest, Puerto Rico, 13 October 1962 (H. Heatwole and F. Torres); ENKW collection.

Etymology.—Named after the island of Puerto Rico.

Distribution.—Known only from Puerto Rico, Greater Antilles.

Diagnosis.—Adults 30-35 mm. in total length; brunneous, moderately infuscate; pectinal tooth count in males 7-8, females 7-8 (mode, 7); metasomal segment II wider than long, III as long or longer than wide; segment V with ventral median and ventral lateral carinae moderate, with medium-sized subconical granules; pedipalp femur deeper than wide; chela weakly to vestigially carinate, shorter than twice its width; tarsomere II spine formula 4/4: 5/5: 6/6: 6/6.

Description.—Measurements of holotype in Table 6. The following description is based on females; adult males are unknown.

Prosoma. Carapace brunneous with diffuse fuscous pattern; lustrous, sparsely punctate throughout, vestigially granulose submedially; anterior margin moderately emarginate, median notch rounded. Venter ochreous fuscescent, lustrous, sparsely setate.

Mesosoma. Tergites brunneous, lateral and posterior margins with moderately dense uniform fuscosity, discs vestigially infuscate; I-VI lustrous, sparsely punctate, vestigially granulose. Tergite VII with disc vestigially bilobed posterolaterally, median area subtly depressed; submedian carinae vestigial, represented by few small granules subdistally; lateral carinae present on distal one-half, weak, granulose; intercarinae vestigially granulose. Genital operculi flavous, subelliptical. Sternites ochreous; III-VI lustrous, smooth; stigmata reniform. Sternite VII tetracarinate; submedian and lateral carinae present on distal one-third, vestigial, smooth; intercarinae smooth.

Metasoma. Ochreous fuscescent to brunneous, with carinae weakly to vestigially infuscate. Ventral submedian carinae on I-III weak to vestigial, subcrenate, parallel; IV moderate, granose, subparallel. Ventral lateral carinae on I-II weak, smooth to subcrenate, subparallel; III weak to moderate, feebly subgranose, slightly divergent distally; IV moderately strong, subgranose,

weakly divergent distally. Lateral inframedian carinae on I weak to moderate, subgranose, complete; II-IV weak to vestigial, subgranose, complete. Lateral supramedian carinae on I-IV moderate, subcrenate to subgranose. Dorsal lateral carinae on I weak, subcrenate; II-IV moderate to strong, crenatogranulose. Intercarinae on I-IV: ventrals and laterals sparsely punctate; dorsals with moderately dense, small granules submedially, on IV longitudinally arranged in keellike pattern and possibly representing vestigial dorsal submedian keels. Segment V longer than pedipalp femur, shorter than twice its width; ventral median keel strong, granulose, ending subdistally in field of scattered granules (Fig. 96); ventral lateral carinae moderate to strong, granulose; lateral median keels present on basal two-thirds, weak to vestigial, subgranose; dorsal lateral carinae moderately strong, granulose; dorsal submedian carinae present on basal one-half, weak to moderate, granulose; anal arc rounded, anal subterminal keel moderate to strong with numerous oblong granules, anal terminal keel vestigial to obsolete and smooth; intercarinae lustrous, sparsely punctate. Telson moderately setate and punctate, vestigially granulose.

Chelicera. Ochreous, vestigially infuscate dorsally (Fig. 103).

Pedipalp. Brunneous, vestigially infuscate; orthobothriotaxia C. Femur trapezoidal in cross section: dorsal internal keel vestigial to obsolete, subgranose; dorsal external keel on basal two-thirds moderately strong and granulose, distally vestigial to obsolete; ventral external keel obsolete; ventral internal keel weak to moderate, granulose; ventral face vestigially granulose; external face smooth; internal face shagreened, sparsely granulose; dorsal face weakly convex, moderately punctate, disc moderately granulose medially. Tibia (Fig. 110): dorsal internal keel obsolete, basal tubercle vestigial and granose; dorsal median keel moderately strong, smooth; dorsal external keel weak to moderate, smooth; external keel obsolete; ventral external keel weak, smooth; ventral median keel obsolete; ventral internal keel weak to moderate, smooth; internal face shagreened, all faces moderately punctate. Chela (Figs. 127-130): dorsal margin on manus rounded and smooth, on fixed finger base subcarinate and smooth; digital keel weak, smooth, ending gradually along fixed finger; dorsal secondary keel vestigial, smooth; external secondary keel vestigial to obsolete; ventral external keel obsolete; ventral median carina moderately strong, smooth; ventral internal keel present on basal submargin, weak, smooth; internal face with ventrad keel vestigial and smooth, mesiad keel obsolete, dorsad keel weak to moderate and smooth to subcrenate; internal and ventral faces lustrous, moderately punctate; dorsal and external faces vestigially reticulate with ridges smooth to subgranose, moderately punctate. Fixed finger base dorsally and externally sparsely punctate and setate; internally moderately punctate, sparsely setate, with subgranose keel along articulation socket. Fingers moderately setate; dentate margins granulose, without distinct pattern, rows, or enlarged granules suggesting such condition.

Legs. Ochreous, vestigially infuscate. Basal segments shagreened. Prolateral pedal spurs moderate on all legs.

Variation.—Variability in pectinal teeth and tarsomere II spine counts is given in Tables 10 and 11, respectively.

Specimens examined.—Puerto Rico: *Mayaguez*: near Tamarindo, Guanica Forest, 13 October 1962 (H. Heatwole, F. Torres), 1 ♀ holotype, 1 juv. ♂ (ENKW); Guanica Forest, 11 September 1948 (J. Maldonado C.), 1 ♀ (ENKW); 29 May 1969 (M.H.M.), 1 ♀ (CAS); Guanica, no date (no collector), 1 juv. ♂ (AMNH); 8 km. E Guanica, 15 September 1963 (P. W. Hummelinck), 2 juv. ♂♂ (ZLRU); 10 km. E Guanica, 15 September 1963 (P. W. Hummelinck), 1 ♀ (ZLRU); Parguera, Cerro Papayo (20-100 meters), 19 September 1963 (P. W. Hummelinck), 5 ♀♀, 2 juv. ♂♂, 4 juv. ♀♀ (ZLRU); Parguera, Isla Magueyes, 10 September 1963 (P. W. Hummelinck), 1 ♀, 1 juv. ♀ (ZLRU); Parguera, NW Isla Cueva, 11 September 1963 (P. W. Hummelinck), 1 juv. ♀ (ZLRU); *Adjuntas*: near Adjuntas, 21 March 1906 (W. Wheeler), 1 ♀ (AMNH).

Heteronebo vachoni, new species
(Figs. 97, 104, 111, 131-134)

Type data.—Holotype male and allotype from Sainte Croix, Cotton Valley, Martinique, 12 June 1955 (R. P. Pinchón); MNd'HN, Paris.

Etymology.—Patronym in honor of Professor Max Vachon for his help and encouragement throughout these studies.

Distribution.—Known only from the island of Martinique, Lesser Antilles.

Diagnosis.—Adults 25 mm. in total length; ochreous fuscescent, sparsely infuscate; pectinal tooth count in males, 5-6 (mode, 5), in females, 5; metasomal segment II wider than long, III approximately as long as wide; segment V ventral median and ventral lateral carinae strong, with medium-sized subconical granules; pedipalp femur slightly deeper than wide, chela moderately to weakly carinate; tarsomere II spine formula 4/4: 4/5: 5/5-6: 5/6.

Description.—Measurements of holotype and allotype in Table 7. The following description is based on males; parenthetical statements refer to females.

Prosoma. Carapace ochreous fuscescent with distinct fuscous pattern; shagreened (lustrous, moderately punctate); anterior submargin vestigially granose; anterior margin feebly emarginate, median notch rounded. Venter ochreous, sparsely setate.

Mesosoma. Tergites ochreous fuscescent with moderately dense, variegated fuscosity; I-VI shagreened (lustrous). Tergite VII tetracarinate; submedian carinae present on distal one-fourth, weak, granulose; lateral carinae present on distal one-half, weak to moderate, granulose; intercarinae shagreened. Genital operculi flavous, paraboloid. Pectines ochroleucous; fulcra very small, apparently vestigial, subtriangular. Sternites ochreous; III-VI lustrous, vestigially punctate; stigmata relatively small, elongate reniform. Sternite VII acarinate, surface feebly punctate.

Metasoma. Ochreous fuscescent, carinae ferrugineous. Ventral submedian carinae on I weak to vestigial, smooth, parallel; II-III weak, subgranose, subparallel; IV weak to moderate, granulose, subparallel. Ventral lateral carinae on I weak, subgranose, feebly convergent distally; II-III weak to

moderate, subgranose, subparallel; IV moderately strong, granulose, feebly divergent distally. Lateral inframedian carinae on I weak, subgranose, complete; II-IV vestigial, subgranose, complete. Lateral supramedian carinae on I-IV moderately strong, crenatogranulose. Dorsal lateral carinae on I-IV moderate, subgranose to granulose. Intercarinae on I-IV vestigially shagreened (lustrous), sparsely punctate; dorsal intercarinae with sparse, vestigial granules submedially. Segment V longer than pedipalp femur, (less than) two times longer than wide; ventral median keel very strong, granulose, ending subdistally in field of randomly scattered small and medium-sized granules, perhaps crudely bifurcate (Fig. 97); ventral transverse keel absent; ventral lateral carinae strong, granulose; lateral median keels present on basal two-thirds, weak, smooth; dorsal lateral carinae moderately strong, subgranose; dorsal submedian carinae present on basal one-third to one-half, weak, subgranose; anal arc rounded, anal subterminal keel moderately strong with numerous oblong granules, anal terminal keel weak to vestigial and smooth; intercarinae smooth to vestigially shagreened. Telson moderately setate and punctate, vestigially granulose on proximal submargin.

Chelicera. Ochreous throughout (Fig. 104).

Pedipalp. Ochreous fuscescent, orthobothriotaxia C. Femur subtrapezoidal in cross section; dorsal internal carina indistinct, with randomly scattered granules in immediate vicinity; dorsal external keel on basal one-third moderate to strong and coarsely granulose, medial one-third weak and subgranose, distal one-third obsolete; ventral external keel obsolete; ventral internal keel poorly defined, granulose; ventral face vestigially shagreened (lustrous); external face lustrous, sparsely punctate; dorsal face moderately convex merging gradually with internal face, vestigially shagreened, disc medially with moderately dense small granulation; internal face moderately granulose. Tibia (Fig. 111): dorsal internal keel obsolete, basal tubercle weak and granose; dorsal median keel moderate, smooth; dorsal external keel weak, smooth; external keel obsolete; ventral external carina weak to moderate, smooth; ventral median keel obsolete; ventral internal keel moderately strong, smooth; internal face shagreened; ventral, dorsal, and external faces vestigially reticulate (smooth), moderately punctate. Chela (Figs. 131-134): dorsal margin rounded to vestigially carinate, subgranose; digital carina moderately strong, smooth, ending gradually at fixed finger base; dorsal secondary and external secondary carinae vestigial, smooth; ventral external carina obsolete; ventral median keel strong, smooth, feebly arcuate; ventral internal carina present at basal submargin, weak to vestigial, smooth; internal face with ventrad keel vestigial and smooth, mesiad keel obsolete, dorsad keel weak and subgranose; chelal faces vestigially reticulate, moderately to densely punctate. Fixed finger base punctate, internally with weak granular keel paralleling articulation socket. Fingers moderately setate; dentate margins granulose, without distinct pattern, rows, or enlarged granules suggesting such condition. Fixed finger with dentate margin feebly emarginate (straight), movable finger dentate margin with matching, feeble, submedian lobe (straight).

Legs. Ochreous, basal segments vestigially infuscate. Prolateral pedal spurs moderate on all legs.

Variation.—The variability observed in pectinal teeth and tarsomere II spine counts appears in Tables 10 and 11, respectively.

Specimens examined.—MARTINIQUE: Sainte Croix, Cotton Valley, 12 June 1955 (R. P. Pinchón); 1 ♂ holotype, 1 ♀ allotype; 3 ♂♂, 1 ♀, 3 juv. ♂♂, 1 juv. ♀ (MNd'HN).

Heteronebo caymanensis, new species
(Figs. 99, 101, 113, 135-138)

Type data.—Holotype male from 2.5 km. NE of Breakers, Grand Cayman, 27 July 1973 (P. W. Hummelinck); ZLRU, Utrecht.

Etymology.—Named after Grand Cayman island.

Distribution.—Known only from Grand Cayman, Greater Antilles.

Diagnosis.—Adult 35-40 mm. in total length; castaneous, weakly infuscate; pectinal tooth count in males and females 8-8; metasomal segment II wider than long, III longer than wide; segment V ventral median and ventral lateral carinae moderate, with dense small granules; pedipalp femur deeper than wide, chela moderately carinate; tarsomere II spine formula 6/6: 6/6: 7/7: 8/8.

Description.—Measurements of holotype in Table 6. The following description is based on males; adult females are unknown.

Prosoma. Carapace castaneous, with distinct variegated fuscous pattern; shagreened to densely, minutely granulose; anterior margin weakly emarginate, median notch rounded. Venter ochreous to ochreous fuscescent, sparsely setate, smooth.

Mesosoma. Tergites brunneous to castaneous, with weak reticular fuscosity; I-VI shagreened, III-VI with posterior submargins sparsely granulose. Tergite VII with disc vestigially bilobed posterolaterally, median emargination indistinct and middle area flat; submedian carinae present on distal submargin, vestigial, granulose; lateral carinae present on distal one-half, weak to moderately strong, granulose; intercarinae shagreened, with sparse to moderately dense small granulation. Genital operculi flavous, ellipsoidal. Sternites III-VI ochreous, lustrous and vestigially punctate; stigmata elongate, about four times longer than wide. Sternite VII ochreous fuscescent, tetracarinate; submedian keels weak, smooth; lateral keels weak to moderately strong, granulose to subgranose; intercarinae shagreened.

Metasoma. Castaneous; distal segments vestigially infuscate, appearing slightly darker. Ventral submedian carinae weak to moderate; I-II subgranose, III-IV finely granulose. Ventral lateral carinae moderately strong; I-II subgranose, III-IV finely granulose. Lateral inframedian carinae on I moderate, subgranose, complete; II-IV weak to vestigial, finely granulose, complete. Lateral supramedian carinae moderate to strong, finely granulose. Dorsal lateral carinae finely granulose; I weak, II-IV moderately strong. Intercarinae on segments I-IV shagreened to densely, minutely granulose. Segment V distinctly longer than pedipalp femur; ventral submedian carina moderately strong and finely granulose, bifurcating at distal submargin into divergently

arcuate branches suggesting remnant ventral transverse keel (Fig. 99); ventral lateral carinae strong, finely granulose; lateral median carinae present on basal two-thirds, weak, subgranose; dorsal lateral carinae weak to moderately strong, finely granulose; anal arc rounded, anal subterminal keel moderately strong with numerous small oblong granules, anal terminal keel obsolete; intercarinae shagreened to densely, minutely granulose. Telson castaneous, moderately granulose and setate.

Chelicera. Ochreous fuscescent, dorsally vestigially infuscate (Fig. 101).

Pedipalp. Brunneous to castaneous, vestigially to weakly infuscate; orthobothriotaxia C. Femur basally subtriangular in cross section, distally trapezoidal in cross section; dorsal internal keel on basal one-fifth vestigial and subgranose, distally obsolete; dorsal external carina weak to moderately strong, granulose; ventral external carina obsolete; ventral internal keel moderate, granulose; external face shagreened; ventral, dorsal, and internal faces densely, minutely granulose. Tibia (Fig. 113): dorsal internal carina obsolete, basal tubercle weak and subgranose; dorsal median and dorsal external carinae strong, smooth; external keel vestigial to obsolete, smooth; ventral external keel moderate, smooth; ventral median keel obsolete; ventral internal carina moderately strong, finely subgranose; ventral face vestigially shagreened, minutely punctate; internal face densely, minutely granulose; dorsal and external faces sparsely to moderately punctate. Chela (Figs. 135-138): dorsal margin of manus rounded to subcarinate, at fixed finger base strongly carinate; digital carina moderately strong, smooth; dorsal secondary keel weak, smooth; external secondary keel weak to vestigial, smooth; ventral external carina obsolete; ventral median keel moderately strong, smooth; ventral internal keel strong, smooth; internal face with ventrad keel vestigial and smooth, mesiad keel vestigial to obsolete and smooth, dorsad keel weak to moderately strong and smooth. Chelal faces vestigially reticulate, minutely punctate; fixed finger base shagreened to minutely granulose. Fixed finger with dentate margin vestigially lobed basally, movable finger with dentate margin feebly emarginate basally. Fingers moderately setate; dentate margins granulose, without distinct pattern, rows, or enlarged granules suggesting such condition.

Legs. Ochreous. Femora shagreened to densely, minutely granulose; all other segments moderately shagreened. Prolateral pedal spurs well developed on all legs.

Variation.—The variability observed in pectinal teeth and tarsomere II spine counts appears in Tables 10 and 11, respectively.

Specimens examined.—Grand Cayman: 2.5 km. NE Breakers, 27 May 1973 (P. W. Hummelinck), 1 ♂ holotype, 1 juv. ♀ partially cannibalized (ZLRU).

Heteronebo bermudezi (Moreno), new combination
(Figs. 98, 106, 112, 139-142)

Diplocentrus bermudezi Moreno, 1938:195, pl. 16, figs. 9-12, pl. 17, fig. 1, 1939:115, pl. 16, pl. 17, figs. 9-12.

Didymocentrus bermudezi: Armas, 1973:6, 1976:2.

Diplocentrus gundlachii: Moreno, 1938:194, pl. 16, figs. 6-8, pl. 17, fig. 2 (misidentification), 1939:113, pl. 15, pl. 17, figs. 6-8 (misidentification); Mello-Leitão, 1945:32 (part ?).

Didymocentrus morenoi Armas, 1973:4, 1976:16. New Synonymy.

Distribution.—Known from two allopatric populations in Provincia Pinar del Río and Provincia Las Villas, Cuba.

Diagnosis.—Adults 30-35 mm. in total length; ochreous fuscescent, vestigially infuscate; pectinal tooth count in males 8, in females 6-8 (mode, 7); segment V ventral median and ventral lateral carinae weak to moderate, with dense small granulation; pedipalp femur deeper than wide, chela vestigially carinate; tarsomere II spine formula on first pair of legs 5/5.

Remarks.—The two allopatric populations are recognized as distinct subspecies: *Heteronebo b. bermudezi* (Moreno), and *H. b. morenoi* (Armas).

Heteronebo bermudezi bermudezi (Moreno), new combination

Diplocentrus bermudezi Moreno, 1938:195, pl. 16, figs. 9-12, pl. 17, fig. 1, 1939:115, pl. 16, pl. 17, figs. 9-12.

Didymocentrus bermudezi: Armas, 1973:6, 1976:2.

Type data.—Holotype female from Ensenada de Corrientes, Provincia Pinar del Río, Cuba, no date (P. G. Bermudez); Escuela de Ciencias Biológicas, Universidad de la Habana, not examined.

Distribution.—Known only from Provincia Pinar del Río, Cuba.

Diagnosis.—Metasomal segment II wider than long, III as long as wide; tarsomere II spine formula 5/5: 6/6: 7/7: 7-8/7-8.

Description.—Measurements of two adult females in Table 7. The following description is based on females; adult males are unavailable.

Prosoma. Carapace ochreous fuscescent, vestigially infuscate; vestigially shagreened, moderately granulose; feebly emarginate anteriorly, median notch rounded. Venter ochreous, sparsely setate, moderately punctate.

Mesosoma. Tergites ochreous fuscescent, vestigially infuscate; I-VI vestigially shagreened, moderately granulose; distal margins rugose to coarsely subgranose. Tergite VII with disc feebly bilobed posterolaterally, median area subtly depressed; submedian carinae present on distal submargin, weak to vestigial, granulose; lateral carinae present on distal one-third to one-half, weak to moderate, granulose; intercarinae moderately granulose. Genital operculi flavous, ellipsoidal. Sternites ochreous; III-VI lustrous, with moderately dense vestigial punctations; stigmata elongate, about three times longer than wide. Sternite VII tetracarinate; submedian keels present on distal one-half, weak to vestigial, crenate to subgranose; lateral carinae present on distal two-thirds, weak, subcrenate; intercarinae smooth.

Metasoma. Ochreous fuscescent. Ventral submedian carinae on I weak to moderate, subcrenate, feebly convergent distally; II-III weak, subgranose, parallel; IV weak, granose, subparallel. Ventral lateral carinae on I-II weak to moderate, subgranose to subcrenate, feebly convergent distally; III weak, subgranose, subparallel; IV weak, granose, feebly divergent distally. Lateral

inframedian carinae on I-IV weak, complete, subgranose to granose. Lateral supramedian carinae on I-IV moderate, granose. Dorsal lateral carinae on I-IV weak to moderate, granulose. Intercarinae on I-IV smooth to vestigially shagreened; dorsally with sparse to moderately dense, small granules. Segment V longer than pedipalp femur, shorter than twice its width; ventral median carina weak to moderate and granulose, bifurcating distally into remnant transverse keel delimiting distal disc (Fig. 98); ventral lateral carinae weak to moderate, granulose; lateral median carinae present on basal two-thirds, weak to vestigial, subgranose; dorsal lateral carinae weak to moderate, granulose; dorsal submedian carinae vestigial, subgranose; anal arc rounded, anal subterminal keel weak with numerous small oblong granules, anal terminal keel vestigial and smooth; intercarinae lustrous, vestigially granulose. Telson moderately granulose, sparsely setate.

Chelicera. Ochreous (Fig. 106).

Pedipalp. Ochreous fuscescent, orthobothriotaxia C. Femur subtrapezoidal in cross section: dorsal internal carina absent, dorsal and internal faces merging smoothly into each other on same plane; dorsal external carina on basal one-half moderately strong and coarsely granose, distally weak to vestigial and granulose; ventral external carina obsolete; ventral internal keel moderate, granulose; ventral face with moderately dense, small and vestigial granules; external face lustrous, smooth to vestigially shagreened; dorsointernal face moderately granulose. Tibia (Fig. 112): dorsal internal keel obsolete, basal tubercle moderate and granulose; dorsal median carina moderate, smooth; dorsal external keel weak, smooth; external keel obsolete; ventral external keel weak, smooth; ventral median keel obsolete; ventral internal keel weak, granulose; internal face weakly to vestigially shagreened; ventral face lustrous, vestigially punctate; dorsal and external faces feebly punctate. Chela (Figs. 139-142): dorsal margin on manus rounded and subgranose, on fixed finger base moderately carinate and smooth; digital carina basally and distally weak and smooth, medially obsolete, ending gradually along fixed finger; dorsal secondary keel vestigial to obsolete, smooth; external secondary and ventral external carinae absent; ventral median keel strong, smooth; ventral internal keel weak to moderate, smooth; internal face with ventrad keel vestigial to obsolete, smooth to subgranose, mesiad keel absent, dorsad keel moderately strong and granulose. Chelal faees bare, feebly punctate, dorsally and externally with punctations in reticular pattern, internal face vestigially granulose. Fixed finger base bare to sparsely setate; internally sparsely to moderately granulose, with paired longitudinal keellike rows of granules paralleling articulation socket. Fingers moderately setate; dentate margins granose, without distinet pattern, rows, or enlarged granules suggesting such condition.

Legs. Ochreous. Basal segments vestigially shagreened. Prolateral pedal spurs moderate on all legs.

Variation.—The variability observed in pectinal teeth and tarsomere II spine counts appears in Tables 10 and 11, respectively.

Specimens examined.—Cuba: *Provincia Pinar del Río*: Guanahacabibes, El Veral, 29 August 1971 (L. Armas), 2 ♀♀ (AMNH), 1 ♀ (OFF).

Heteronebo bermudezi morenoi (Armas), new combination

Didymocentrus morenoi Armas, 1973:4, 1976:16

Diplocentrus gundlachii: Moreno, 1938:194, pl. 16, figs. 6-8, pl. 17, fig. 2 (misidentification), 1939:113, pl. 15, pl. 17, figs. 6-8 (misidentification); Mello-Leitão, 1945:32 (part ?).

Type data.—Holotype female from Lomas de Trinidad, Provincia Las Villas, Cuba, no date (J. Morte); IZACC, La Habana, not examined.

Distribution.—Known only from southern Provincia Las Villas, Cuba.

Diagnosis.—Metasomal segment II as long or longer than wide, III longer than wide; tarsomere II spine formula 5/5: 5-6/5-6: 6/7: 7/7.

Description.—Measurements of adult male and female in Table 7. Females very similar to nominate subspecies, differing only in the diagnostic characters given above. Males differ from females in the usual secondary sexual characters of the genital and pectinal regions, and in having the carapace and tergites shagreened.

Variation.—Variability observed in pectinal teeth and tarsomere II spine counts appears in Tables 10 and 11, respectively.

Specimens examined.—CUBA: *Provincia Las Villas*: Cienfuegos, "alrededores del Castillo de Jagua," 3 February 1973 (L. Armas), 1 ♂, 2♀♀ (AMNH), 1♀ (OFF).

Heteronebo jamaicae, new species
(Figs. 100, 105, 114, 143-146)

Diplocentrus scaber: Pocock, 1893*b*:396 (part), 1898:392 (part); Kraepelin, 1893:15 (part); Waterman, 1950:168 (part); Baerg, 1954:96, fig. 3 (misidentification); Bücherl, 1959:269 (misidentification).

Type data.—Holotype male and allotype from College Common, Mona Heights, St. Andrew Parish, Jamaica, 18 July 1968 (F. D. Bennett and T. H. Farr); ENKW collection.

Etymology.—Named for the island of Jamaica.

Distribution.—This species is known from three morphologically distinct, allopatric populations on the island of Jamaica, Greater Antilles.

Diagnosis.—Adults 30-35 mm. in total length; ochreous fuscescent, weakly to moderately infuscate; pectinal tooth count in males 6-8 (mode, 7), in females 6-7 (mode, 6); metasomal segment II wider than long, III as long or longer than wide; segment V ventral median and ventral lateral carinae weak, with dense small granules; pedipalp femur deeper than wide, chela weakly carinate; tarsomere II spine formula on first two pairs of legs 4/4: 5/5.

Description.—Measurements of holotype male and allotype in Table 8. The following description is based on males; parenthetical statements refer to females.

Prosoma. Carapace ochreous fuscescent with distinct fuscous pattern; coarsely shagreened; feebly emarginate anteriorly, median notch rounded. Venter ochreous, sparsely setate, moderately punctate.

Mesosoma. Tergites ochreous fuscescent, diffusely infuscate throughout; I-VI shagreened. Tergite VII vestigially bilobed posterolaterally, median area subtly depressed; submedian carinae present on distal submargin, weak,

minutely granulose; lateral carinae present on distal one-half, weak to moderate, granulose; intercarinae coarsely shagreened. Genital operculi ochreous, subellipsoidal with feeble anteromedian emargination. Sternites ochreous; III-VI lustrous, vestigially punctate; stigmata elongate, about three times longer than wide. Sternite VII tetracarinate; submedian and lateral keels present on distal one-third, weak to vestigial, smooth (subcrenate); median and submedian intercarinae smooth, laterals vestigially shagreened.

Metasoma. Ochreous fuscescent to brunneous. Ventral submedian carinae on I-II weak, crenate to subgranose, subparallel; III-IV vestigial, minutely granulose, subparallel. Ventral lateral carinae on I moderately strong, subgranose, feebly convergent distally; II moderate, smooth to minutely granulose, subparallel; III-IV weak, minutely granulose, subparallel to slightly divergent distally. Lateral inframedian carinae on I weak, subgranose; II-III vestigial, complete, minutely granulose; IV vestigial to obsolete, minutely granulose. Lateral supramedian carinae on I-IV moderate to weak, minutely granulose, terminating distally in prominent angular tubercle. Dorsal lateral carinae on I-IV weak to moderate, minutely granulose, ending abruptly at distal submargins. Intercarinal spaces on segments I-IV coarsely shagreened. Segment V longer than pedipalp femur, less than two times as long as wide; ventral submedian keel weak, granulose, distinctly bifurcate subdistally with branches arcuate and strongly divergent, crudely resembling ventral transverse keel (Fig. 100); ventral lateral carinae weak, on basal three-fourths minutely granulose, distal one-fourth with medium-sized subconical granules; lateral median carinae present on basal one-half, vestigial, minutely granulose; dorsal lateral carinae weak, minutely granulose; anal arc rounded, anal subterminal keel weak and with numerous small rounded granules, anal terminal keel vestigial to obsolete and smooth; intercarinae coarsely shagreened. Telson sparsely setate; densely, minutely granulose.

Chelicera. Ochreous (Fig. 105).

Pedipalp. Ochreous fuscescent, orthobothriotaxia C. Femur trapezoidal in cross section; dorsal internal carina obsolete; dorsal external keel moderately strong, coarsely granulose; ventral external keel obsolete; ventral internal keel strong, coarsely granulose; ventral and external faces shagreened; dorsal and internal faces shagreened, with moderately dense small granulation; dorsal face moderately convex transversely, with gradual nonangulose transition into internal face. Tibia (Fig. 114): dorsal internal keel obsolete, basal tubercle vestigial and granose; dorsal median keel strong, minutely granulose; dorsal external carina moderately strong (weak to vestigial), minutely granulose (smooth); external keel obsolete; ventral internal keel weak to moderate, minutely granulose; ventral face shagreened, vestigially reticulate; internal face shagreened to densely, minutely granulose; dorsal and external faces moderately punctate, shagreened (lustrous). Chela (Figs. 143-146): dorsal margin on chela rounded and smooth to subgranose, on fixed finger base moderately carinate; digital keel weak to moderate, smooth, extending through fixed finger; dorsal secondary keel obsolete; external secondary keel weak to vestigial,

smooth; ventral external keel obsolete; ventral median keel strong, smooth; ventral internal keel weak to moderate, smooth; internal face with ventrad keel vestigial and smooth, mesiad keel obsolete, dorsad keel strong and minutely granulose. Chelal faces moderately punctate, coarsely shagreened with granules dorsally assuming reticular pattern. Fixed finger base shagreened; internally with weak, longitudinal, granulose keel paralleling articulation socket. Fingers densely punctate, sparsely setate; dentate margins granulose, without distinct pattern, rows, or enlarged granules suggesting such condition.

Legs. Ochreous, with all segments except tarsomeres shagreened. Prolateral pedal spurs moderate on all legs.

Variation.—The variability observed in pectinal teeth and tarsomere II spine counts appears in Tables 10 and 11, respectively.

Remarks.—Each allopatric population is recognized as a distinct subspecies.

Specimens examined.—See subspecific accounts that follow.

Heteronebo jamaicae jamaicae

Type data and *Etymology.*—The same as for *H. jamaicae* Francke.

Distribution.—Known only from the coastal regions of St. Andrew and St. Thomas Parishes, Jamaica.

Diagnosis.—Segment V with ventral median keel distinctly bifurcate distally; pedipalp tibia shorter than chela width; legs with prolateral pedal spurs moderately developed; tarsomere II spine formula 4/4: 5/5: 6/6-7: 6/7.

Description.—The same as that of *H. jamaicae* Francke.

Specimens examined.—JAMAICA: *St. Andrew Parish*: Mona Heights, College Common, 18 July 1968 (F. D. Bennett, T. H. Farr), 1 ♂ holotype, 1 ♀ allotype, 13 ♂♂, 4 ♀♀ (ENKW); Dallas Mts. road (300 meters), E Mona, 5 May 1973 (P. W. Hummelinck), 1 ♂, 1 juv. ♂ (ZLRU); *St. Thomas Parish*: 14 miles E Kingston, 10 December 1967 (N. L. H. Krauss), 1 ♀ (AMNH).

Heteronebo jamaicae occidentalis, new subspecies

Diplocentrus scaber: Pocock, 1893*b*:396 (part).

Type data.—Holotype female from Windsor, Trelawny Parish, Jamaica, 20 August 1966 (R. P. Bengry); ENKW collection.

Etymology.—The name *occidentalis*, from the Latin *occidental*, refers to the subspecies' distribution in western Jamaica.

Distribution.—Known only from Trelawny and St. James Parishes, Jamaica.

Diagnosis.—Segment V with ventral median keel distinctly bifurcate distally; pedipalp tibia shorter than chela width; legs with prolateral pedal spurs vestigial to obsolete, at least on last two pairs; tarsomere II spine formula 4/4: 5/5: 5-6/6: 6/6.

Description.—Measurements of holotype and adult male in Table 8. *H. j. occidentalis* differs from the nominate subspecies in the diagnostic characters indicated above.

Variation.—The variability observed in pectinal tooth counts and tarsomere II spine counts appears in Tables 10 and 11, respectively. Pedal spurs on leg

I vary from moderate to vestigial, leg II weak to vestigial, legs III and IV vestigial to obsolete.

Specimens examined.—JAMAICA: no exact locality, no date (no collector), 1 ♂, 3 ♀♀ (BM); *Trelawny Parish*: Windsor, 20 August 1966 (R. P. Bengry), 1 ♀ holotype, 1 ♀ (ENKW); *St. James Parish*: Montego Bay, Palm Beach, 3 May 1911 (A. Petrunkevitch), 2 ♀♀ (IB), 1 ♂, 5 ♀♀, 2 juv. ♂♂, 1 juv. ♀ (AMNH).

Heteronebo jamaicae portlandensis, new subspecies

Type data.—Holotype female from 2 miles W Ecclesdown, John Crow Mts., Portland Parish, Jamaica, no date (G. Underwood); ENKW collection.

Etymology.—Named for the parish in which it occurs.

Distribution.—Known only from the type locality.

Diagnosis.—Metasomal segment V with ventral median keel not distinctly bifurcate distally, ending in field of scattered granules; pedipalp tibia longer than chela width; legs with prolateral spurs moderately developed; tarsomere II spine formula 4/4: 5/5: 5/6: 5/6.

Description.—Measurements of holotype, and only known specimen, in Table 8. Differs from *H. j. jamaicae* and *H. j. occidentalis* in the diagnostic characters indicated above.

Comparative Descriptions

The genus *Heteronebo*, distributed mainly in the Greater Antilles, consists of two species groups. Accurate locality data, however, are unavailable for two species: *H. granti* and *H. forbesii*.

The *granti* group (*H. granti*, *H. forbesii*, *H. elegans* from Jamaica, *H. portoricensis* from Puerto Rico, and *H. vachoni* from Martinique) is characterized by the presence of medium and large subconical granules on the ventral carinae of metasomal segments IV and V. *Heteronebo granti*, the type species of the genus, is distinctive in being the largest species and the only one in which the pedipalp femur is wider than deep. *H. granti* appears to be most closely related to *H. elegans*, with which it uniquely shares the following characters: metasomal segment V with the ventral median keel distinctly bifurcate distally; pedipalp chela longer than twice its width, moderately to strongly carinate; and metasomal segment II approximately as long as wide. These two species differ in pectinal tooth counts, tarsomere II spine formulae, pedipalp femur proportions (relative width and depth), development of the ventral submedian carinae on metasomal segments I-II, and size. The remaining three species of the *granti* group show a reduction in the development of the chelal carinae, in pectinal tooth counts, and in tarsomere II spine counts. *H. forbesii* is recognized by its vestigially carinate pedipalp chela, metasomal segment II longer than wide, and segment V with a tetrafurcate ventral median keel; *H. portoricensis* and *H. vachoni* have metasomal segment II wider than long and the ventral median keel of segment V ending in a field of randomly scattered granules. The last two species differ in pectinal tooth counts, tarsomere II spine formulae, and in the extent of carinal development on the pedipalp chelae.

The *bermudezi* group (*H. bermudezi* from Cuba, *H. caymanensis* from Grand Cayman, and *H. jamaicae* from Jamaica) is characterized by the presence of dense, small and minute granulation on the metasomal carinae, particularly the dorsal and lateral carinae on all segments and the ventral carinae on segments IV and V. *Heteronebo caymanensis* is the largest species in this group, has the highest pectinal tooth counts and tarsomere II spine counts, and possesses moderately carinate chelae. *H. bermudezi* and *H. jamaicae*, on the other hand, are smaller, have lower pectinal and spinal counts, and bear weakly to vestigially carinate chelae. The last two species differ in tarsomere II spine counts.

Heteronebo jamaicae occidentalis is of special interest because it shows a strong tendency towards the loss of the prolateral pedal spurs on all legs. These seemingly insignificant structures are one of the primary characters used to arrive at the currently accepted familial and superfamilial classification of scorpions. However, two genera are known to have representatives lacking pedal spurs: *Typhlochactas* Mitchell (Chactidae) and *Oieclus* Simon (Diplocentridae); these two genera deviate markedly from the expected characterization of their respective families. *H. jamaicae occidentalis* seems to be losing the pedal spurs, exemplifying one more case of convergent evolution in scorpions and indicating that the pedal spurs are not as stable a character as previously thought. Consequently, the role of pedal spurs in scorpion classification schemes needs to be reevaluated, and, if necessary, the currently accepted classification modified accordingly.

Compared with *Diplocentrus*, *Heteronebo* can be separated easily by the absence of a ventral transverse keel on metasomal segment V in the latter. In addition, *Heteronebo* has a pedipalp femur that is deeper than wide and fixed and movable cheliceral fingers that are shorter than the chela width and length, respectively. Those species of *Diplocentrus* with similar femoral proportions have chelicerae in which the fixed and movable fingers are longer than the chela width and length, respectively.

Keys to Circum-Caribbean Diplocentridae

Key to Genera

1. Metasomal segment V with distinct ventral transverse keel (Figs. 1-9) 2
   Metasomal segment V without distinct ventral transverse keel (Figs. 93-100) ..... *Heteronebo*, p. 36
2. Pedipalp femur wider than deep; chela with ventral median keel oblique, directed towards internal condyle of movable finger articulation ..... *Didymocentrus*, p. 5
   Pedipalp femur deeper than wide; chela with ventral median keel not oblique (= parallel), directed towards external one-half of movable finger articulation, and usually towards external condyle 3
3. Prolateral pedal spurs present on all legs 4
   Prolateral pedal spurs absent from all legs ..... *Oieclus*, p. 33
4. Tarsomere I on all legs bearing conspicuous pores on ventral and prolateral areas, metasomal segments dorsoventrally compressed ..... *Tarsoporosus*, p. 23
   Tarsomere I on any leg not bearing pores on ventral and prolateral areas, metasomal segments subcylindrical ..... *Cazierius*, p. 26

Key to Species of Didymocentrus

1. Metasomal segment II length less than its width, segment V length/width ratio less than 1.85; ratio of pedipalp chela width/carapace length less than 0.75 (Central America) . . 2
   Metasomal segment II length equal to or greater than its width, segment V length/width ratio more than 1.85; ratio of pedipalp chela width/carapace length greater than 0.75 (Caribbean) 3
2. Tarsomere II spine formula 3/3: 4/4: 5/5: 5/5 (El Salvador and Honduras) ..... *D. krausi*, p. 20
   Tarsomere II spine formula 4/4: 5/5: 6/6: 6/6 (Nicaragua) ..... *D. nitidus*, p. 19
3. Tarsomere II spine formula 4/4: 5/5: 5/6: 5/6 (Lesser Antilles, Bonaire) ..... *D. hummelincki*, p. 14
   Tarsomere II spine formula 3/3: 4/4: 5/5: 5/5 4
4. Pectinal tooth counts predominantly 10 in males, 9 in females 6
   Pectinal tooth counts predominantly less than 10 in males, less than 9 in females 5
5. Adults under 40 mm. in total length (usually under 35 mm.); pectinal tooth count in males 7-8 (mode, 8), in females 7-8 (mode, 7) (Lesser Antilles, St. Vincent) ..... *D. minor*, p. 8
   Adults over 40 mm. in total length; pectinal tooth count in males 8-10 (mode, 9), in females 7-10 (mode, 8) (Lesser Antilles, St. Lucia, and Martinique) .... *D. lesueurii*, p. 6
6. Adults over 45 mm. in total length; pedipalp chela length less than twice its width (Lesser Antilles, Curaçao) ..... *D. hasethi*, p. 13
   Adults under 45 mm. in total length (usually under 40 mm.); pedipalp chela length equal to or greater than twice its width 7
7. Metasoma with dorsal and lateral intercarinae smooth, segment V with dorsal lateral carinae smooth to subgranose, color testaceous to testaceo-ferrugineous (Lesser Antilles, Grenada) ..... *D. waeringi*, p. 11
   Metasoma with dorsal and lateral intercarinae granulose, segment V with dorsal lateral carinae coarsely granulose, color ochreous to ochreous-fuscescent (Greater Antilles, Cuba) ..... *D. trinitarius*, p. 16

Key to Species of Cazierius

1. Tarsomere II spine formula on third pair of legs 7/7 (Brasil ?) ..... *politus*, p. 28
   Tarsomere II spine formula on third pair of legs 6/6 2
2. Tarsomere II spine formula on fourth pair of legs 6/6-7; metasomal segment III wider than long (Cuba) ..... *gundlachii*, p. 26
   Tarsomere II spine formula on fourth pair of legs 7/7; metasomal segment III as long as wide (Barbados) ..... *scaber*, p. 30

Key to Species and Subspecies of Heteronebo

1. Dorsal and lateral carinae on metasomal segments I-V, and ventral carinae on segments IV-V with dense, small and minute granulation (*bermudezi* group) 6
   Dorsal and lateral carinae on metasomal segments I-V, and ventral carinae on segments IV-V without dense, small and minute granulation (*granti* group) 2
2. Tarsomere II spine formula on first pair of legs 5/5 3
   Tarsomere II spine formula on first pair of legs 4/4 4
3. Pedipalp femur wider than deep, longer than metasomal segment IV; tarsomere II spine formula on second pair of legs 5-6/6 (Abd-el-Kuri, Yemen?) ..... *granti*, p. 37
   Pedipalp femur deeper than wide, shorter than metasomal segment IV; tarsomere II spine formula on second pair of legs 5/5 (Abd-el-Kuri, Yemen?) ..... *forbesii*, p. 41

4. Tarsomere II spine formula on last three pairs of legs 4/5: 5/5-6: 5/6 (Martinique) ..... *vachoni*, p. 45
   Tarsomere II spine formula on last three pairs of legs 5/5: 6/6: 6/6 5
5. Pedipalp chela as long as, or longer than twice its width; females with six pectinal teeth per comb (Jamaica) ..... *elegans*, p. 39
   Pedipalp chela shorter than twice its width; females with seven or eight pectinal teeth per comb (Puerto Rico) ..... *portoricensis*, p. 43
6. Tarsomere II spine formula on first pair of legs 6/6 (Grand Cayman) ..... *caymanensis*, p. 47
   Tarsomere II spine formula on first pair of legs less than 6/6 7
7. Tarsomere II spine formula on first pair of legs 5/5 (Cuba) ... *bermudezi*, p. 48 ... 8
   Tarsomere II spine formula on first pair of legs 4/4 (Jamaica) ..... *jamaicae*, p. 51 9
8. Tarsomere II spine formula on last two pairs of legs 7/7:7-8/7-8; metasomal segment II wider than long (western Cuba) ..... *bermudezi bermudezi*, p. 49
   Tarsomere II spine formula on last two pairs of legs 6/7:7/7; metasomal segment II as long as, or longer than wide (central Cuba) ..... *bermudezi morenoi*, p. 51
9. Tarsomere II spine formula on last two pairs of legs 6/6-7:6/7 (SE coast, Jamaica) ..... *jamaicae jamaicae*, p. 53
   Tarsomere II spine formula on last two pairs of legs 5-6/6: 5-6/6 10
10. Prolateral pedal spurs on last two pairs of legs vestigial to obsolete; metasomal segment V with ventral median carina distinctly bifurcate distally (NW Jamaica) ..... *jamaicae occidentalis*, p. 53
    Prolateral pedal spurs on last two pairs of legs moderately developed; metasomal segment V with ventral median carina not distinctly bifurcate distally (NE mountains, Jamaica) ..... *jamaicae portlandensis*, p. 54

Literature Cited

Armas, L. F. de. 1973. Tipos de las Colecciones Escorpiológicas P. Franganillo y Universidad de la Habana. Poeyana, 101:1-18.

———. 1974*a*. Escorpiones del Archipiélago Cubano. II. Hallazgo del Género *Microtityus*, con las Descripciones de un Nuevo Subgénero y Tres Nuevas Especies. Poeyana, 132:1-26.

———. 1974*b*. Escorpiones del Archipiélago Cubano. IV. Nueva Especie de *Rhopalurus*. Poeyana, 136:1-12.

———. 1976. Escorpiones del Archipiélago Cubano. VI. Familia Diplocentridae. Poeyana, 147:1-35.

Baerg, W. J. 1954. Notes on the common Jamaican scorpion *Centruroides insulanus* Thorell. Nat. Hist. Notes, Jamaica, 66:95-96.

Banks, N. 1900. Synopses of North-American Invertebrates. IX. The Scorpions, Solpugids, and Pedipalpi. Amer. Nat., 34:421-427.

———. 1904. The Archnida of Florida. Proc. Acad. Nat. Sci. Philadelphia, 56:120-147.

———. 1906. Arachnida from the Bahamas. Bull. Amer. Mus. Nat. Hist., 22:185-189.

Becker, L. 1880. Etudes sur les Scorpions. Ann. Soc. Entomol. Belgique, 24:134-145.

Birula, A. A. B. 1917*a*. Fauna of Russia and Adjacent Countries. Arachnoidea, Scorpions 1(1):1-224. [English translation by Israeli Program for Scientific Translations, Jerusalem 1965, 154 pp.]

———. 1917*b*. Arthrogastric Arachnids of Caucasia. Part 1, Scorpions. Ann. Caucasian Mus., ser. A, No. 5, 253 pp. [English translation by Israeli Program for Scientific Translations, Jerusalem 1964, 170 pp.]

Bücherl, W. 1959. Escorpiões e Escorpionismo no Brasil. X. Catalogo da Colezão escorpionica do Instituto Butantan. Mem. Inst. Butantan, 29:255-275.

———. 1967. Escorpiões, Aranhas e Escolopendromorfos da Amazonia. Atas do simpósio sôbre a biota Amazônica, 5:111-125.

———. 1969. Giftige Arthropoden. Pp. 764-793, *in* Biogeography and Ecology in South America (E. J. Fittkau, J. Illies, H. King, G. H. Schwabe, and H. Sioli, eds.). Monographiae biol. 19, vol. 1, 873 pp.

———. 1971. Acúleus que Matam. Edit. Melhoramentos, São Paulo, 142 pp.

Caporiacco, L. di. 1938. Aracnidi del Messico, di Guatemala e Honduras Britanico. Atti Soc. Italiana Sci. Nat., Milano, 77:251-282.

———. 1951. Studi sugli Aracnidi del Venezuela raccolti dalla Sezioni di Biologia (U. C. V.). la. Parte: Scorpiones, Opiliones, Solifuga y Chernetes. Acta Biol. Venezuelica, 1(1):1-46.

Comstock, J. H. 1912. The spider book. Doubleday, Doran & Co., New York, 721 pp.

———. 1940. The spider book (revised and edited by W. J. Gertsch). Cornell Univ. Press, Ithaca, New York, 729 pp.

Díaz Nájera, A. 1975. Listas y datos de distribución geográfica de los alacranes de México. Rev. Invest. Salud Publ., México, 35:1-36.

Esquivel de Verde, M. A., and C. E. Machado-Allison. 1969. Escorpiones. Imprenta Univ., Caracas, 52 pp.

Francke, O. F. 1975. A new species of *Diplocentrus* from New Mexico and Arizona. J. Arachnol., 2:107-118.

———. 1977*a*. Taxonomic observations on *Heteronebo* Pocock. J. Arachnol. 4:95-114.

———. 1977*b*. Scorpions of the genus *Diplocentrus* Peters from Oaxaca, México. J. Arachnol. 4:145-200.

———. 1977c. The genus *Diplocentrus* in the Yucatán Peninsula with description of two new troglobites. Assoc. Mexican Cave Studies Bull., 6:49-61.

Franganillo, P. 1930. Mas arácnidos nuevos de la Isla de Cuba. Inst. Nac. Invest. Cien. La Habana, 1:1-53.

———. 1935. Estudio de los arácnidos recogidos durante el verano de 1934. Rev. Belen, 9(49-50):20-26.

———. 1936. Los arácnidos de Cuba hasta 1936. Imprenta Cultural, La Habana, 164 pp.

Gertsch, W. J., and M. E. Soleglad. 1966. The scorpions of the *Vejovis boreus* group (Subgenus *Paruroctonus*) in North America. Amer. Mus. Novit., 2278:1-54.

Gervais, P. M. 1844*a*. Remarques sur la Famille des Scorpions et description de plusiers espèces nouvelles de la collection du Muséum. Arch. Mus. Nat. Hist. Nat. Paris, 4:201-240.

———. 1844*b*. Scorpions. Pp. 14-74, *in* Historie naturelle des Insectes. Apteres (C. A. Walckenaer and P. M. Gervais, eds.). Librarie Encycl., Paris, vol. 3, 418 pp.

Hirst, A. S. 1907. Notes on scorpions, with descriptions of two new species. Ann. Mag. Nat. Hist., ser. 7, 19:208-211.

Hoffmann, C. C. 1931. Los Scorpiones de México. la. Parte: Diplocentridae, Chactidae, Vejovidae. An. Inst. Biol. Univ. México, 2(4):291-408.

Honetschlager, L. D. 1965. A new method for hunting scorpions. Turtox News, 43:69.

Hummelinck, P. W. 1938. De Namen van de afgebeelde Planten en Dieren. Pp. 208-209, *in* De Nederlandse Antillen en de overige eilanden van de Caraibische zee, Venezuela en Colombia (M. Realino, ed.). R. K. Boekhandel "St. Augustinus," St. Thomas-College, Curaçao, 214 pp.

———. 1940. Scorpions. Studies Fauna Curaçao, Aruba, Bonaire and Venezuelan Islands, The Hague 2:138-146.

Karsch, F. 1879. Scorpionologische Beiträge, II. Mitt. Münchener entomol. Ver., 3:97-136.

———. 1880. Arachnologische blätter. X. Scorpionologische Fragmente. Z. ges. naturw. Halle, 53:404-409.

Kjellesvig-Waering, E. N. 1966. The Scorpions of Trinidad and Tobago. Caribbean J. Sci., 6:123-135.

KRAEPELIN, K. 1893. Revision der Skorpione II: Scorpionidae und Bothriuridae. Jahrb. Hamburgischen Wiss. Anst. Bericht Mitt. Nat. Mus., 11:1-248.

———. 1896. Neue und wenige bekannte Skorpione. Jahrb. Hamburgischen Wiss. Anst. Bericht Mitt. Nat. Mus., 13:119-146.

———. 1899. Skorpiones und Pedipalpi. Tierreich, 8:1-265.

———. 1901. Catalogue des Scorpiones des collections du Museum d'Histoire Naturelle de Paris. Bull. Mus. Nat. Hist. Nat. Paris, 7:265-274.

———. 1905. Die geographische Verbreitung der Scorpione. Zool. Jahrb., Abth. Syst., Geogr., Biol. Thiere, 22:321-364.

KRAUS, O. 1955. Escorpiones de El Salvador. Comun. Inst. Trop. Invest. Cien., Univ. Nac. San Salvador, 4:101-104.

LAMPE, E. 1918. Katalog der Skorpione, Pedipalpen und Solifugen des naturhistorischen Museums der Residenzstadt Weisbaden. Jahrb. Nassauischer Ver. Naturk., 70:185-205.

LAURIE, M. 1896. Further notes on the anatomy and development of scorpions, and their bearing on the classification of the order. Ann. Mag. Nat. Hist., ser 6, 18:121-133.

LINNAEUS, C. 1758. Systema naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis, 1:1-824, i-iii (reprint ed. of 1894—"Cura Societatis Zoologicae Gernanicae iterum edita").

LÖNNBERG, E. 1897. Om Skorpionernas och Pedipalpernas geografiska Utbredning. Entomol. Tidskr., 18:193-211.

MARX, G. 1888. Remarks on the types of Scorpionidae described by Wood. Proc. Entomol. Soc. Washington, 1:90-94.

MELLO-CAMPOS, O. DE. 1924. Escorpiões brasileiros. Mem. Inst. Oswaldo Cruz, 17:237-301. [English translation, Scorpions of Brazil, Mem. Inst Oswaldo Cruz, 17:303-363.]

MELLO-LEITÃO, C. DE. 1932. Nota sobre escorpiões Sul-Americanos. Arch. Mus. Nac. Rio de Janeiro, 34:9-46.

———. 1945. Escorpiões Sul-Americanos. Arch. Mus. Nac. Rio de Janeiro, 40:1-468.

MILLOT, J., AND M. VACHON. 1949. Ordre des Scorpions. Pp. 386-436, *in* Traite de Zoologie (P. P. Grassé, ed.), Masson et Cie., Paris, 6:1-979.

MORENO, A. 1938. Contribución al estudio de los escorpionidos Cubanos. Parte 1—Superfamilia Scorpionoidea. Mem. Soc. Cubana Hist. Nat. "Felipe Poey," 12:191-203.

———. 1939. Escorpiología Cubana. Rev. Univ. Habana, 23:87-130.

MUMA, M. H. 1967. Scorpions, whip scorpions and wind scorpions of Florida. Arthropods of Florida, 4:1-28.

PENTHER, A. 1913. Beitrag zur Kenntnis amerikanischer Skorpione. Ann. Nat. Mus. Vienna, 27:239-252.

PETERS, W. 1861. Scorpiones. Monatsb. Kön. preuss. Akad. Wiss. Berlin, pp. 507-516.

POCOCK, R. I. 1893*a*. Notes on the classification of scorpions, followed by some observations upon synonymy, with descriptions of new genera and species. Ann. Mag. Nat. Hist., ser. 6, 12:303-330.

———. 1893*b*. Contributions to our knowledge of the arthropod fauna of the West Indies. Part 1, Scorpions and Pedipalpi. J. Zool., London, 24:374-409.

———. 1894. Scorpions and their geographical distribution. Nat. Sci., 4:353-364.

———. 1898. Descriptions of some new scorpions from Central and South America. Ann. Mag. Nat. Hist., ser. 7, 1:384-394.

———. 1899. The Expedition to Sokotra III. Descriptions of the new species of Scorpions, Centipedes, and Millipedes. Bull. Liverpool Mus., 2:7-9.

———. 1902. Arachnida: Scorpiones, Pedipalpi, and Solifugae. Biologia Centrali-Americana, London, 72 pp.

———. 1903. Scorpions and Spiders of Abd-el-Kuri. Pp. 202-205, *in* The natural history of Sokotra and Abd-el-Kuri (Henry O. Forbes, ed.), H. Young & Sons, Liverpool, 282 pp.

Roewer, C. F. 1943. Ueber eine neuerworbene Sammlung von Skorpionen des Natur-Museum Senckenberg. Senckenbergiana, 26:205-244.

Rosin, R., and A. Shulov. 1963. Studies on the scorpion *Nebo hierochonticus*. Proc. Zool. Soc. London, 140:547-575.

Schenkel, E. 1932. Notizen ueber einige Scorpione und Solifugen. Rev. suisse Zool., 39(15):375-396.

Scorza, J. V. 1954*a*. Escorpiones del alto Orinoco. Bol. Soc. Venezolana Cien. Nat., 15(82):163-175.

———. 1954*b*. Contribución al estudio de los escorpiones Venezolanos. Arch. Venezolanos Patol. Trop. Parasit. Med., 2:157-165.

———. 1954*c*. Sistemática, distribución geográfica y observaciones ecológicas de algunos alacranes encontrados en Venezuela. Mem. Soc. Cien. Nat. La Salle, 14:179-214.

Simon, E. 1872. Arachnides de Syrie rapportés par M. Charles Piochard de la Brulerie. Ann. Soc. Entomol. France, ser. 5, 2:245-266.

———. 1878. Descriptions de deux noveaux genres de l'ordre des Scorpiones. Ann. Soc. Entomol. France, ser. 5, 8:399-400.

———. 1880. Descriptions de Genres et Espèces de l'ordre des Scorpiones. Ann. Soc. Entomol. France, ser. 5, 10:377-398.

Stahnke, H. L. 1967. *Diplocentrus bigbendensis*, a new species of scorpion. Entomol. News, 78:173-179.

———. 1968. Some Diplocentrid scorpions from Baja California del Sur, México. Proc. California Acad. Sci., ser. 4, 35:273-320.

———. 1970. Scorpion nomenclature and mensuration. Entomol. News, 81:297-316.

Torres, F., and H. Heatwole. 1967. Factors influencing behavioral interactions of female parent and offspring in scorpions. Caribbean J. Sci., 7:19-22.

Vachon, M. 1974. Etudes des caracteres utilisés pour classer les familles et les genres de Scorpions. Bull. Mus. Nat. Hist. Nat. Paris, ser. 3, No. 140, Zool. 104, pp. 857-958.

Waterman, J. A. 1950. Scorpions in the West Indies with special reference to *Tityus trinitatis*. Caribbean Med. J., 12:167-177.

Werner, F. 1925. Zur Kenntnis der Fauna der Insel Bonaire. Z. Wiss. Zool., 125:533-556.

———. 1934. Scorpiones. Pp. 1-316, *in* Klassen und Ordnungen des Tierreichs (H. G. Bronn, ed.), Akad. Verlag, Leipzig, Bd. 5, Abt. 4, Buch 8, 512 pp.

Williams, S. C. 1968. Methods of sampling scorpion populations. Proc. California Acad. Sci., ser. 4, 36:221-230.

———. 1974. A new genus of North American scorpions with a key to the North American genera of Vaejovidae. Proc. California Acad. Sci., ser. 4, 40:1-16.

Williams, S. C., and V. F. Lee. 1975. Diplocentrid scorpions from Baja California Sur, México. Occas. Papers California Acad. Sci., 115:1-27.

Wood, H. C. 1863. On the Pedipalpi of North America. J. Acad. Nat. Sci. Philadelphia, ser. 2, 5:357-376.

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Appendix

Tables and figures have been placed together in an appendix to facilitate use by the reader. Tables appear in the order in which they are cited in text. Figures are grouped into plates that deal with taxonomically important morphological characters for circum-Caribbean diplocentrids: metasoma, metasomal segment V, chelicera, and trichobothrial patterns of the pedipalp, pedipalp tibia, and pedipalp chela.

Table 1.—*Measurements (in millimeters) of* Didymocentrus lesueurii *(Gervais) from St. Lucia, and* Didymocentrus minor *from St. Vincent.*

	D. lesueurii			*D. minor*	
Character	Holotype *D. lesueurii* female	Lectotype *D. antillanus* female	Paralectotype *D. antillanus* male	Holotype male	Allotype female
Total length	47.85	44.10	45.00	34.20	34.00
Carapace length	6.25	6.05	5.70	4.40	4.20
Anterior width	3.45	3.20	3.00	2.30	2.20
Width at median eyes	5.20	5.20	5.05	3.50	3.60
Posterior width	6.55	6.40	6.00	4.20	4.20
Mesosoma length	16.20	14.10	13.60	10.50	12.10
Metasoma length	25.40	23.95	25.70	19.30	17.70
I length/width	3.10/3.90	3.00/3.30	3.20/3.40	2.40/2.60	2.20/2.50
II length/width	3.40/3.40	3.20/3.00	3.40/3.20	2.70/2.30	2.40/2.25
III length/width	3.55/3.20	3.40/2.85	3.60/3.05	2.80/2.15	2.50/2.15
IV length/width	4.20/3.00	3.90/2.70	4.30/2.70	3.20/2.00	2.90/2.00
V length/width	5.85/2.80	5.35/2.50	6.00/2.40	4.20/1.85	3.90/1.90
Telson length	5.30	5.10	5.20	4.00	3.80
Vesicle length	4.30	4.00	4.10	3.20	3.00
Vesicle width	2.90	2.55	2.35	1.90	2.10
Vesicle depth	2.30	2.10	2.00	1.55	1.60
Aculeus length	1.00	1.10	1.10	0.80	0.80
Pedipalp length	19.55	18.60	19.80	14.55	12.95
Femur length	4.55	4.40	4.70	3.40	3.10
Femur width	2.15	2.10	2.10	1.60	1.45
Femur depth	2.05	2.00	2.00	1.25	1.20
Tibia length	4.55	4.50	4.70	3.50	3.05
Tibia width	2.30	2.25	2.40	1.55	1.50
Chela length	10.45	9.70	10.40	7.65	6.80
Chela width	5.80	5.10	5.10	3.80	3.20
Chela depth	3.80	3.40	3.15	2.10	2.00
Movable finger length	6.30	5.90	6.50	4.50	3.80
Fixed finger length	4.60	4.20	5.00	3.30	2.75
Chelicera					
Chela length		2.05	2.00	1.55	1.50
Chela width		1.30	1.30	1.00	0.95
Movable finger length		1.80	1.70	1.25	1.20
Fixed finger length		1.10	1.00	0.75	0.70
Pectinal tooth count					
Left/right	8-8	8-8	9-9	8-8	8-7

TABLE 2.—*Measurements (in millimeters) of* Didymocentrus waeringi *from Grenada,* Didymocentrus hasethi *(Kraepelin), from Curaçao, and* Didymocentrus hummelincki *from Bonaire.*

	D. waeringi		*D. hasethi*		*D. hummelincki*	
Character	Holotype male	Allotype female	Holotype female	Adult male	Holotype female	Paratype female
Total length	38.90	41.10	46.35	46.30	43.05	40.85
Carapace length	5.20	5.70	6.00	5.90	5.60	5.45
Anterior width	2.70	2.90	3.30	3.20	3.25	3.10
Width at median eyes	4.30	4.60	5.20	5.20	5.00	4.70
Posterior width	5.05	5.55	6.20	6.25	5.80	5.50
Mesosoma length	11.80	13.90	15.20	13.30	14.50	14.00
Metasoma length	21.90	21.50	25.15	27.10	22.95	21.40
I length/width	2.90/3.00	2.80/3.05	3.10/3.70	3.40/3.50	2.85/3.40	2.60/3.10
II length/width	3.00/2.60	2.90/2.70	3.35/3.20	3.70/3.10	3.10/3.00	2.80/2.90
III length/width	3.20/2.50	3.00/2.60	3.50/3.00	3.90/2.90	3.20/2.90	3.00/2.80
IV length/width	3.70/2.30	3.60/2.35	4.10/2.80	4.50/2.65	3.80/2.75	3.50/2.50
V length/width	4.70/2.05	4.60/2.30	5.50/2.70	6.00/2.60	5.00/2.45	4.70/2.45
Telson length	4.40	4.60	5.60	5.60	5.00	4.80
Vesicle length	3.50	3.70	4.50	4.50	4.00	3.90
Vesicle width	2.15	2.60	2.90	2.60	3.00	2.75
Vesicle depth	1.80	2.05	2.30	2.10	2.20	2.10
Aculeus length	0.90	0.90	1.10	1.10	1.00	0.90
Pedipalp length	18.90	18.50	18.90	19.95	17.35	16.60
Femur length	4.50	4.50	4.50	4.65	4.00	3.80
Femur width	2.00	2.00	2.00	2.10	2.00	1.90
Femur depth	1.40	1.50	1.90	1.70	1.70	1.70
Tibia length	4.50	4.40	4.40	4.70	4.15	3.90
Tibia width	1.90	1.95	2.05	2.10	2.05	2.00
Chela length	9.90	9.60	10.00	10.60	9.20	8.90
Chela width	4.40	4.65	5.50	5.60	5.00	4.85
Chela depth	2.40	2.80	3.10	3.00	3.10	3.00
Movable finger length	6.10	5.70	6.30	6.90	5.50	5.50
Fixed finger length	4.50	4.20	4.40	5.00	3.85	3.90
Chelicera						
Chela length	1.65	1.90	2.05	2.00	2.00	1.80
Chela width	1.10	1.20	1.35	1.30	1.25	1.20
Movable finger length	1.30	1.50	1.70	1.55	1.60	1.50
Fixed finger length	0.80	0.90	0.90	0.85	0.95	0.90
Pectinal tooth count						
Left/right	10-10	9-9	9-9	10-10	9-9	10-9

TABLE 3.—*Measurements (in millimeters) of* Didymocentrus trinitarius *(Franganillo) from Cuba,* Didymocentrus nitidus *(Hirst) from Nicaragua,* Didymocentrus krausi *from El Salvador, and* Tarsoporosus kugleri *(Schenkel) from Venezuela.*

Character	*D. trinitarius*		*D. nitidus*	*D. krausi*	*T. kugleri*	
	Adult male	Adult female	Holotype female	Holotype female	Holotype female	Adult male
Total length	38.35	34.60	38.50	29.45	47.90	52.30
Carapace length	4.55	4.50	5.40	4.00	6.50	6.50
Anterior width	2.40	2.40	3.00	1.95	3.10	3.30
Width at median eyes	3.70	3.55	4.60	3.10	5.00	4.90
Posterior width	4.35	4.10	5.70	3.80	6.25	6.20
Mesosoma length	12.60	12.30	10.75	11.15	17.05	17.00
Metasoma length	21.20	17.80	22.35	14.30	24.35	28.80
I length/width	2.80/2.60	2.30/2.50	2.60/3.40	1.80/2.35	3.20/4.00	4.00/4.40
II length/width	3.00/2.30	2.40/2.20	3.00/3.15	1.90/2.05	3.45/3.80	4.25/4.10
III length/width	3.20/2.25	2.50/2.10	3.20/3.00	2.00/1.95	3.60/3.75	4.45/4.20
IV length/width	3.50/2.10	2.90/2.00	3.50/2.90	2.40/1.85	4.00/3.60	5.05/4.20
V length/width	4.40/1.85	3.80/1.90	4.85/2.70	3.05/1.75	4.80/3.45	5.75/4.05
Telson length	4.30	3.90	5.20	3.15	5.30	5.30
Vesicle length	3.40	3.05	4.30	2.50	4.40	4.50
Vesicle width	1.95	2.00	2.90	1.75	3.30	3.60
Vesicle depth	1.75	1.70	2.20	1.35	2.20	2.10
Aculeus length	0.90	0.85	0.90	0.65	0.90	0.80
Pedipalp length	15.30	13.90	18.20	11.45	18.65	17.60
Femur length	3.60	3.20	4.30	2.70	4.45	4.10
Femur width	1.70	1.50	1.85	1.40	2.00	2.00
Femur depth	1.40	1.35	1.70	1.20	2.20	2.30
Tibia length	3.70	3.30	4.50	2.90	4.70	4.50
Tibia width	1.60	1.50	1.80	1.30	2.15	2.15
Chela length	8.00	7.40	9.40	5.85	9.50	9.00
Chela width	4.20	3.40	3.90	2.80	5.00	5.30
Chela depth	2.45	2.25	2.80	1.80	3.20	3.30
Movable finger length	4.80	4.00	5.50	3.15	6.00	5.30
Fixed finger length	3.40	2.90	4.10	2.25	4.00	3.50
Chelicera						
Chela length	1.60	1.60	1.90	1.25		2.10
Chela width	0.95	0.95	1.20	0.85		1.50
Movable finger length	1.20	1.20	1.45	1.10		1.95
Fixed finger length	0.70	0.70	0.80	0.55		1.35
Pectinal tooth count						
Left/right	10-10	10-10	9-9	9-9	11-10	13-15

TABLE 4.—*Measurements (in millimeters) of* Cazierius gundlachii *(Karsch) from Cuba,* Cazierius scaber *(Pocock) from Barbados, and* Cazierius politus *(Pocock) from Brazil (?).*

Character	*C. gundlachii*		*C. scaber*	*C. politus*		
	Adult male	Adult female	Lectotype female	Lectotype female	Paralectotypes female	male
Total length	28.20	33.15	31.30	33.30	30.05	20.70
Carapace length	4.00	4.50	4.50	4.60	4.20	3.05
Anterior width	1.85	2.10	2.30	2.30	2.20	1.50
Width at median eyes	3.20	3.70	3.55	3.75	3.40	2.40
Posterior width	3.90	4.80	4.50	4.60	4.30	3.00
Mesosoma length	8.60	11.20	9.50	11.00	9.90	6.75
Metasoma length	15.60	17.45	17.30	17.70	15.95	10.90
I length/width	1.80/2.70	2.10/2.95	2.00/2.80	2.00/3.00	1.85/2.70	1.30/2.00
II length/width	2.00/2.55	2.25/2.80	2.30/2.60	2.25/2.80	2.00/2.55	1.40/1.85
III length/width	2.20/2.45	2.45/2.70	2.50/2.50	2.40/2.75	2.20/2.50	1.50/1.80
IV length/width	2.60/2.30	2.80/2.60	2.90/2.40	3.05/2.60	2.80/2.40	1.90/1.70
V length/width	3.50/2.20	3.75/2.50	3.70/2.30	3.75/2.50	3.40/2.30	2.40/1.65
Telson length	3.70	4.10	3.90	4.25	3.70	2.40
Vesicle length	3.00	3.60	3.10	3.50	3.00	1.90
Vesicle width	2.00	2.55	2.10	2.50	2.30	1.40
Vesicle depth	1.50	1.85	1.60	1.80	1.65	1.00
Aculeus length	0.75	0.50	0.80	0.75	0.70	0.50
Pedipalp length	11.30	13.20	13.30	13.10	11.45	8.20
Femur length	2.50	2.90	3.00	3.00	2.70	1.90
Femur width	1.25	1.45	1.40	1.40	1.25	0.90
Femur depth	1.45	1.60	1.60	1.70	1.40	1.10
Tibia length	2.90	3.30	3.20	3.10	2.75	2.00
Tibia width	1.45	1.65	1.55	1.50	1.35	1.05
Chela length	5.90	7.00	7.10	7.00	6.00	4.30
Chela width	3.60	3.90	3.70	4.00	3.60	2.10
Chela depth	2.30	2.60	2.50	2.60	2.20	1.55
Movable finger length	3.20	4.10	4.40	4.00	3.30	2.50
Fixed finger length	1.90	2.80	3.20	2.80	2.40	1.70
Chelicera						
Chela length	1.25	1.50	1.30	1.55	1.30	1.05
Chela width	0.90	1.05	1.05	1.10	1.00	0.75
Movable finger length	1.10	1.40	1.20	1.50	1.40	1.00
Fixed finger length	0.70	0.80	0.70	0.90	0.90	0.60
Pectinal tooth count						
Left/right	8-8	7-7	6-6	7-7	7-7	7-8

TABLE 5.—*Measurements (in millimeters) of* Oieclus purvesii purvesii *(Becker) from Antigua, and* Oieclus purvesii sabae *from Saba.*

Character	*O. p. purvesii*			*O. p. sabae*	
	Holotype male	Adult male	Adult female	Holotype male	Paratype male
Total length	25.70	31.85	27.95	28.20	29.10
Carapace length	3.50	4.20	3.90	3.85	4.00
Anterior width	1.85	2.00	1.90	1.90	2.10
Width at median eyes	2.60	3.10	2.75	2.70	2.90
Posterior width	3.20	3.90	3.60	3.40	3.60
Mesosoma length	6.60	9.10	9.20	7.90	8.15
Metasoma length	15.60	18.55	14.85	16.45	16.95
I length/width	1.90/2.30	2.30/2.80	1.75/2.45	2.00/2.50	2.05/2.55
II length/width	2.10/2.10	2.50/2.65	1.95/2.20	2.20/2.35	2.30/2.45
III length/width	2.25/2.05	2.70/2.60	2.15/2.20	2.45/2.25	2.50/2.30
IV length/width	2.75/1.95	3.25/2.50	2.50/2.05	2.95/2.15	3.00/2.25
V length/width	3.40/1.85	4.00/2.40	3.20/2.00	3.60/2.00	3.70/2.05
Telson length	3.20	3.80	3.30	3.25	3.40
Vesicle length	2.50	2.90	2.60	2.60	2.65
Vesicle width	1.60	1.95	2.00	1.60	1.70
Vesicle depth	1.20	1.45	1.50	1.20	1.20
Aculeus length	0.70	0.90	0.70	0.65	0.75
Pedipalp length	8.85	10.45	10.00	10.40	10.70
Femur length	2.15	2.60	2.40	2.50	2.50
Femur width	1.00	1.25	1.15	1.20	1.20
Femur depth	1.25	1.55	1.40	1.35	1.35
Tibia length	2.30	2.75	2.45	2.70	2.70
Tibia width	1.20	1.40	1.30	1.30	1.35
Chela length	4.40	5.10	5.15	5.20	5.50
Chela width	2.95	3.45	2.75	3.30	3.50
Chela depth	1.80	2.30	1.90	2.00	2.20
Movable finger length	2.50	2.90	3.00	3.00	3.05
Fixed finger length	1.50	1.75	2.00	1.90	2.05
Chelicera					
Chela length/width	1.10/0.80	1.30/0.90	1.20/0.90	1.15/0.80	1.20/0.90
Movable finger length	1.10	1.30	1.20	1.20	1.30
Fixed finger length	0.75	0.90	0.90	0.80	0.90
Pectinal tooth count					
Left/right	6-7	7-7	7-6	7-7	7-7

TABLE 6.—*Measurements (in millimeters) of* Heteronebo granti *Pocock from Abd-el-Kuri (?),* Heteronebo elegans *from Jamaica,* Heteronebo forbesii *Pocock from Abd-el-Kuri (?),* Heteronebo portoricensis *from Puerto Rico, and* Heteronebo caymanensis *from Grand Cayman.*

	granti	*elegans*		*forbesii*	*portoricensis*	*caymanensis*
Character	Lectotype female	Holotype female	Paratopotype female	Lectotype female	Holotype female	Holotype male
Total length	44.05	34.15	24.70	40.70	31.15	37.90
Carapace length	5.70	4.70	3.65	5.30	4.30	5.00
Anterior width	3.20	2.30	2.00	2.60	2.10	2.60
Width at median eyes	4.70	3.70	3.15	4.05	3.35	4.10
Posterior width	5.70	4.90	3.90	4.80	4.20	5.10
Mesosoma length	15.50	11.65	8.10	13.80	10.20	10.50
Metasoma length	22.85	17.80	12.95	21.60	16.65	22.40
I length/width	2.70/3.20	2.10/2.45	1.55/2.10	2.80/3.10	2.00/2.50	2.60/3.40
II length/width	3.00/2.90	2.35/2.30	1.70/1.95	3.00/2.80	2.20/2.40	2.90/3.00
III length/width	3.10/2.80	2.45/2.20	1.80/1.85	3.20/2.75	2.35/2.30	3.20/2.95
IV length/width	3.65/2.70	3.00/2.15	2.10/1.75	3.60/2.60	2.80/2.25	3.90/2.85
V length/width	5.20/2.65	4.00/2.10	2.80/1.65	4.55/2.45	3.70/2.10	5.10/2.65
Telson length	5.20	3.90	3.00	4.45	3.60	4.70
Vesicle length	4.20	3.25	2.50	3.30	2.80	3.80
Vesicle width	2.80	2.10	1.70	2.50	2.05	2.35
Vesicle depth	1.95	1.60	1.30	1.80	1.50	1.75
Aculeus length	1.00	0.65	0.50	1.15	0.80	0.90
Pedipalp length	17.90	14.45	10.80	15.05	13.20	14.70
Femur length	4.20	3.30	2.50	3.50	3.00	3.40
Femur width	2.00	1.50	1.20	1.55	1.35	1.60
Femur depth	1.80	1.65	1.30	1.75	1.45	1.85
Tibia length	4.30	3.40	2.70	3.55	3.20	3.70
Tibia width	2.10	1.65	1.35	1.70	1.50	1.70
Chela length	9.40	7.75	5.60	8.00	7.00	7.60
Chela width	4.50	3.40	2.80	4.05	3.80	4.70
Chela depth	3.10	2.30	1.80	2.80	2.35	2.90
Movable finger length	5.50	4.60	3.50	4.75	4.15	4.95
Fixed finger length	4.10	3.40	2.45	3.40	2.90	3.35
Chelicera						
Chela length	1.80	1.50	1.25	1.80	1.35	1.55
Chela width	1.20	1.05	0.90	1.10	0.95	1.05
Movable finger length	1.50	1.45	1.10	1.65	1.15	1.35
Fixed finger length	0.80	0.85	0.65	0.85	0.70	0.80
Pectinal tooth count						
Left/right	8-8	6-6	6-6	8-9	7-7	8-8

TABLE 7.—*Measurements (in millimeters) of* Heteronebo vachoni *from Martinique,* Heteronebo bermudezi bermudezi *(Moreno) from western Cuba, and* Heteronebo bermudezi morenoi *(Armas) from central Cuba.*

Character	*H. vachoni*		*H. b. bermudezi*		*H. b. morenoi*	
	Holotype male	Allotype female	Adult female	Adult female	Adult male	Adult female
Total length	24.95	24.45	31.10	30.05	28.90	31.35
Carapace length	3.40	3.55	4.20	4.25	3.75	4.20
Anterior width	1.75	1.80	2.15	2.10	1.85	2.15
Width at median eyes	2.80	2.85	3.40	3.35	2.95	3.40
Posterior width	3.30	3.60	4.40	4.40	3.80	4.45
Mesosoma length	8.70	8.20	10.20	9.80	8.70	10.50
Metasoma length	12.85	12.70	16.70	16.00	16.45	16.65
I length/width	1.60/2.05	1.50/2.05	2.00/2.65	1.95/2.55	2.00/2.35	1.95/2.50
II length/width	1.70/1.85	1.60/1.90	2.15/2.40	2.10/2.40	2.20/2.10	2.20/2.25
III length/width	1.80/1.75	1.70/1.80	2.35/2.30	2.30/2.30	2.35/2.05	2.35/2.20
IV length/width	2.15/1.60	2.00/1.65	2.80/2.20	2.75/2.20	2.80/1.95	2.80/2.15
V length/width	2.90/1.45	2.90/1.60	3.80/2.10	3.45/2.10	3.60/1.85	3.65/2.10
Telson length	2.70	3.00	3.60	3.45	3.50	3.70
Vesicle length	2.10	2.30	2.90	2.80	2.85	3.00
Vesicle width	1.40	1.65	2.15	1.95	1.60	2.05
Vesicle depth	1.10	1.30	1.60	1.50	1.35	1.60
Aculeus length	0.60	0.70	0.70	0.65	0.65	0.70
Pedipalp length	9.75	10.05	12.05	12.10	11.25	12.60
Femur length	2.30	2.35	2.70	2.80	2.60	2.90
Femur width	1.10	1.20	1.35	1.40	1.30	1.40
Femur depth	1.20	1.25	1.50	1.50	1.50	1.60
Tibia length	2.45	2.50	2.95	2.90	2.80	3.00
Tibia width	1.30	1.30	1.45	1.45	1.40	1.60
Chela length	5.00	5.20	6.40	6.40	5.85	6.70
Chela width	2.95	2.80	3.35	3.35	3.40	3.50
Chela depth	1.65	1.75	2.25	2.30	2.10	2.30
Movable finger length	2.75	2.95	3.85	3.90	3.40	4.05
Fixed finger length	1.85	2.05	2.60	2.65	2.35	2.80
Chelicera						
Chela length	1.05	1.10	1.35	1.30	1.20	1.40
Chela width	0.70	0.75	0.95	0.90	0.85	1.00
Movable finger length	0.90	1.00	1.15	1.10	1.05	1.20
Fixed finger length	0.55	0.55	0.70	0.65	0.65	0.80
Pectinal tooth count						
Left/right	5-5	5-5	7-6	7-7	8-8	7-7

TABLE 8.—*Measurements (in millimeters) of subspecies of* Heteronebo jamaicae *from Jamaica.*

Character	*H. j. jamaicae*		*H. j. occidentalis*		*H. j. portlandensis*
	Holotype male	Allotype female	Holotype female	Paratype male	Holotype female
Total length	33.05	35.60	30.35	32.65	28.30
Carapace length	4.45	5.00	4.20	4.50	4.10
Anterior width	2.20	2.50	2.30	2.30	2.10
Width at median eyes	3.50	4.10	3.60	3.60	3.25
Posterior width	4.45	5.05	4.30	4.50	4.00
Mesosoma length	9.90	11.65	10.10	9.70	8.90
Metasoma length	18.70	18.95	16.05	18.45	15.30
I length/width	2.20/2.80	2.20/3.05	1.90/2.50	2.20/2.80	1.70/2.40
II length/width	2.50/2.60	2.50/2.80	2.10/2.35	2.40/2.50	1.95/2.20
III length/width	2.70/2.55	2.70/2.75	2.30/2.30	2.70/2.40	2.15/2.15
IV length/width	3.30/2.50	3.30/2.65	2.70/2.20	3.15/2.25	2.60/2.10
V length/width	4.00/2.40	4.05/2.50	3.50/2.20	4.10/2.20	3.40/2.05
Telson length	4.00	4.20	3.55	3.90	3.50
Vesicle length	3.20	3.40	2.80	3.00	2.75
Vesicle width	1.95	2.25	1.95	1.90	1.80
Vesicle depth	1.50	1.75	1.35	1.50	1.40
Aculeus length	0.80	0.80	0.75	0.90	0.75
Pedipalp length	12.90	14.30	12.80	12.90	11.85
Femur length	3.00	3.30	2.80	2.90	2.70
Femur width	1.40	1.60	1.40	1.45	1.25
Femur depth	1.60	1.75	1.65	1.60	1.45
Tibia length	3.10	3.40	3.10	3.10	3.00
Tibia width	1.50	1.70	1.55	1.60	1.45
Chela length	6.80	7.60	6.90	6.90	6.15
Chela width	3.95	4.20	3.45	3.70	2.85
Chela depth	2.35	2.70	2.30	2.60	2.05
Movable finger length	4.15	4.80	4.20	4.30	3.60
Fixed finger length	2.85	3.45	3.00	2.60	2.50
Chelicera					
Chela length	1.40	1.60	1.40		1.25
Chela width	0.90	1.10	0.95		0.90
Movable finger length	1.10	1.40	1.35		1.10
Fixed finger length	0.70	0.85	0.80		0.80
Pectinal tooth count					
Left/right	7-7	6-6	5-6	7-7	6-7

TABLE 9.—*Variability in the number of lateral eyes observed in circum-Caribbean Diplocentridae, expressed as the number of individuals observed with a given eye count.*

Species	Eye Count					
	0-2	2-2	2-3	3-3	3-4	4-4
Didymocentrus						
lesueurii						
St. Lucia population				42	6	7
Martinique population			1	56	5	2
minor				10		
hummelincki				24	1	
hasethi				16		
trinitarius			1	19		
waeringi				8		
nitidus				1		
krausi				2		
Tarsoporosus						
kugleri				6		
Cazierius						
politus				3		
scaber				1		
gundlachii				10	1	
Oieclus purvesii						
purvesii	1	52				
sabae		7	1			
hybrids (*purvesii* × *sabae*)		4				
Heteronebo						
granti				2		
forbesii				3		
caymanensis				1		
elegans				2		
jamaicae				27		
vachoni			1	9		
portoricensis			1	22		
bermudezi				7		

TABLE 10.—*Variability in pectinal tooth counts in four genera of circum-Caribbean Diplocentridae, expressed as the number of combs observed with a given tooth count.*

			Tooth count					
Species	Sex	*N*	5	6	7	8	9	10
Didymocentrus								
lesueurii	♂	43				6	77	3
	♀	75			6	112	31	1
minor	♂	7			1	13		
	♀	3			4	2		
waeringi	♂	4						8
	♀	4					8	
hasethi	♂	3						6
	♀	12				1	18	5
hummelincki	♂	2						4
	♀	22				7	36	1
trinitarius	♂	5					1	9
	♀	14				1	22	5
nitidus	♀	1					2	
krausi	♀	2					4	
Cazierius								
gundlachii	♂	2				4		
	♀	8		1	14	1		
politus	♂	1			1	1		
	♀	2			4			
scaber	♀	1		2				
Oiechus								
purvesii								
purvesii	♂	33	1	6	57	2		
	♀	12	2	19	1			
sabae	♂	4			8			
	♀	3		4	2			
purvesii × *sabae*	♂	4			8			
	♀	5		8	2			
Heteronebo								
granti	♀	2				4		
elegans	♀	2		4				
forbesii	♂	1					1	1
	♀	2				3	1	
portoricensis	♂	6			7	5		
	♀	17			26	8		
vachoni	♂	7	12	2				
	♀	3	6					
bermudezi								
bermudezi	♀	3	1	1	4			
morenoi	♂	1				2		
	♀	3			5	1		
jamaicae								
jamaicae	♂	14		1	26	1		
	♀	6		12				
occidentalis	♂	4		4	4			
	♀	11	1	21				
portlandensis	♀	1		1	1			

TABLE 11.—*Variability in tarsomere II spine counts in circum-Caribbean Diplocentridae, expressed as the number of rows observed with a given spine count. P= prolateral row, R= retrolateral row.*

		Leg I				Leg II				Leg III					Leg IV				
Species	Row	2	3	4	5	3	4	5	6	4	5	6	7	8	4	5	6	7	8
Didymocentrus																			
lesueurii	P	2	233			1	231	4		32	202				9	227			
	R	1	228	6		1	226	9		4	229	2			1	218	15		
minor	P		18				17				18					18			
	R	1	18				17				18					17	1		
waeringi	P		13			1	12			1	13					14			
	R		13			1	12			1	13					11	3		
hasethi	P		30				30			1	29					30			
	R		29	1			27	3			30					15	15		
hummelincki	P		4	44		1	7	40			48				1	47			
	R		1	46	1		1	47			1	47				1	47		
trinitarius	P		36				37			3	35				1	36	1		
	R		36				37			2	33	3				36	2		
nitidus	P			2				2				2					1		
	R			2				2				2					1		
krausi	P		4				4				4					3			
	R		4				4				4					3			

TABLE 11.—*Continued.*

Species	Row	Leg I				Leg II				Leg III					Leg IV				
		2	3	4	5	3	4	5	6	4	5	6	7	8	4	5	6	7	8
Tarsoporosus																			
kugleri	P		1	7			1	6	1			5	3				6	2	
	R			4	4			6	2			2	6				1	6	1
Cazierius																			
gundlachii	P		2	18				20	2		4	16	1			1	17	4	
	R		1	19			1	21				16	6			1	11	10	
politus	P			5				2	4			2	4					4	2
	R			5				3	3			1	5					4	2
scaber	P			1				2				2						2	
	R			1				2				2					1	1	
Oieclus purvesii																			
purvesii	P	1	86	3		1	86	2		7	81	1			3	85	1		
	R		89	1		1	88			1	88					87	2		
sabae	P			14		1		13			14					8	6		
	R		6	8			13	1			13	1				3	10		
purvesii × *sabae*																			
♂	P		2	6			2	5			8					8			
♂	R		6	2			7				7	1				6	2		
♀	P		9	1			7	3			10					10			
♀	R		8	2			10				10					9	1		

TABLE 11.—*Continued.*

Heteronebo																	
granti	P			1	3			2	2			3				1	3
	R				4				4			3					3
elegans	P			4				4				4					4
	R			3	1			4				4					4
forbesii	P			1	5			5				5					3
	R				4			5				5					3
portoricensis	P			45			3	43			4	40				1	43
	R			43	2			46				44					34
vachoni	P			20			19			1	18					19	1
	R			18	2			19			7	13				1	19
bermudezi																	
bermudezi	P				6				6			1	4				
	R			1	5				6				4	1			
morenoi	P				8			4	4			6	2				2
	R			1	7			3	5				8				
jamaicae																	
jamaicae	P		1	38			2	38			1	37	1			1	36
	R			35	4			34	6		2	24	13				9
occidentalis	P			23				29			11	15				7	20
	R			22	1		1	28			1	24	1			1	22
portlandensis	P			2				2			1					2	
	R			1	1			2				1					2

Heteronebo																	
granti	P																
	R																
elegans	P																
	R																
forbesii	P																
	R																
portoricensis	P																
	R																
vachoni	P																
	R																
bermudezi																	
bermudezi	P																
	R																
morenoi	P																
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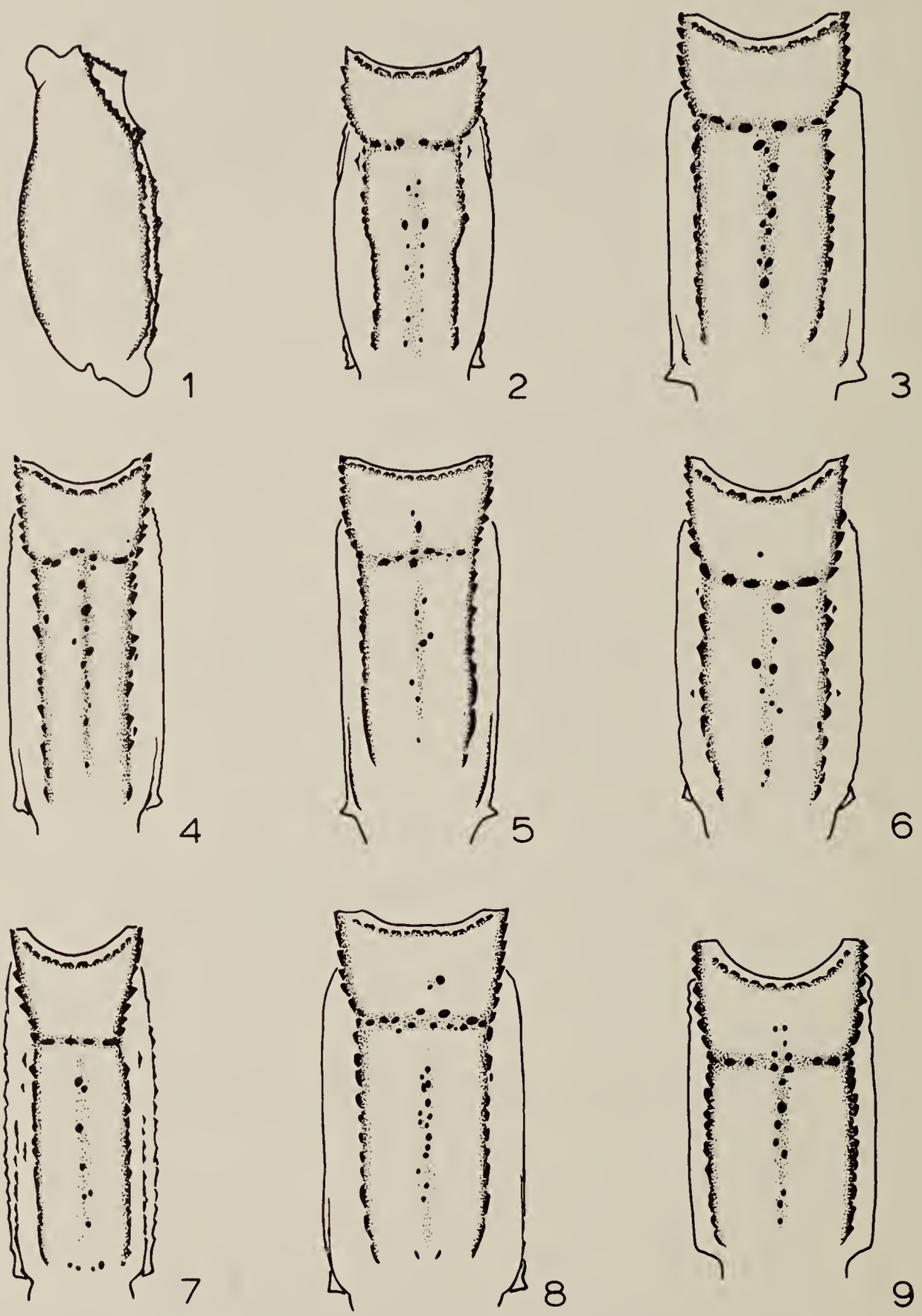
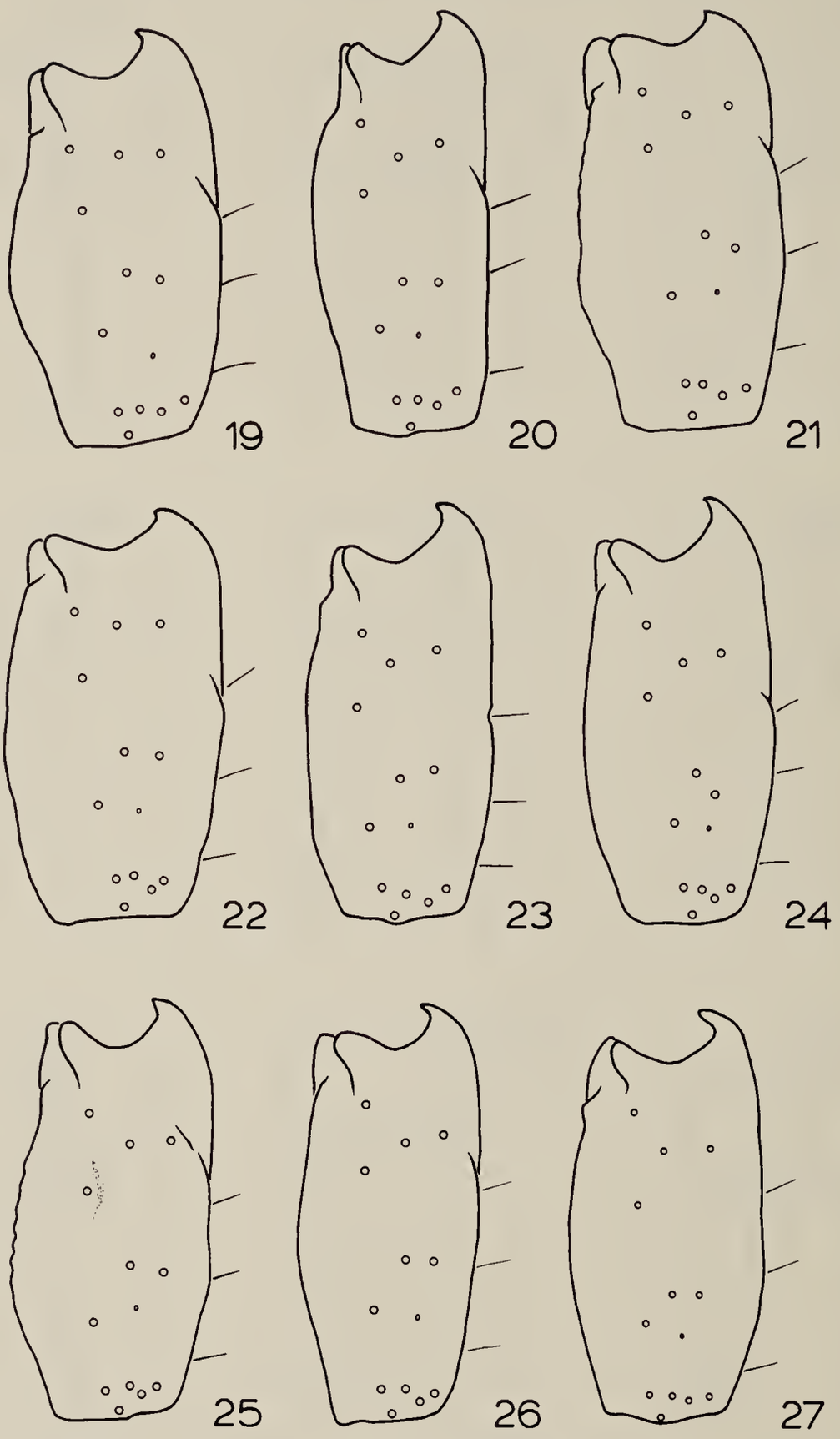
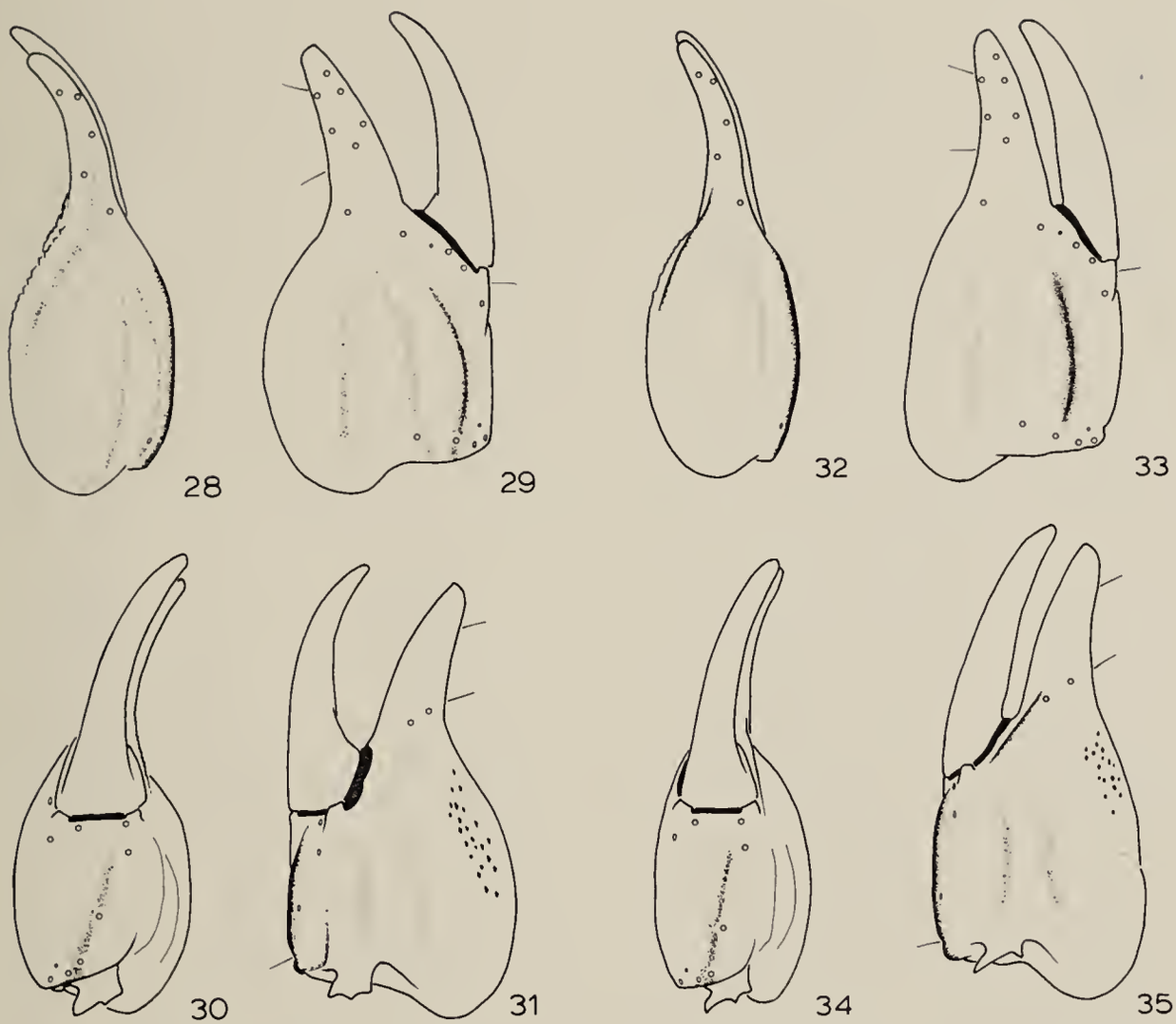


FIGS. 1-9.—Metasomal segment V of species of *Didymocentrus* (1, lateral aspect; 2-9, ventral aspect): 1 and 2, *D. lesueurii* holotype female; 3, *D. hummelincki* holotype female; 4, *D. hasethi* adult male; 5, *D. minor* holotype male; 6, *D. waeringi* adult female; 7, *D. trinitarius* adult male; 8, *D. nitidus* holotype female; 9, *D. krausi* holotype female.

FIGS. 10-18.—Dorsal aspect of right chelicera of species of *Didymocentrus* and *Tarsoporosus*: 10, *D. lesueurii* adult female; 11, *D. minor* holotype male; 12, *D. waeringi* allotype female; 13, *D. hummelincki* holotype female; 14, *D. hasethi* adult female; 15, *D. krausi* holotype female; 16, *D. trinitarius* adult male; 17, *D. nitidus* holotype female; 18, *Tarsoporosus kugleri* adult male.

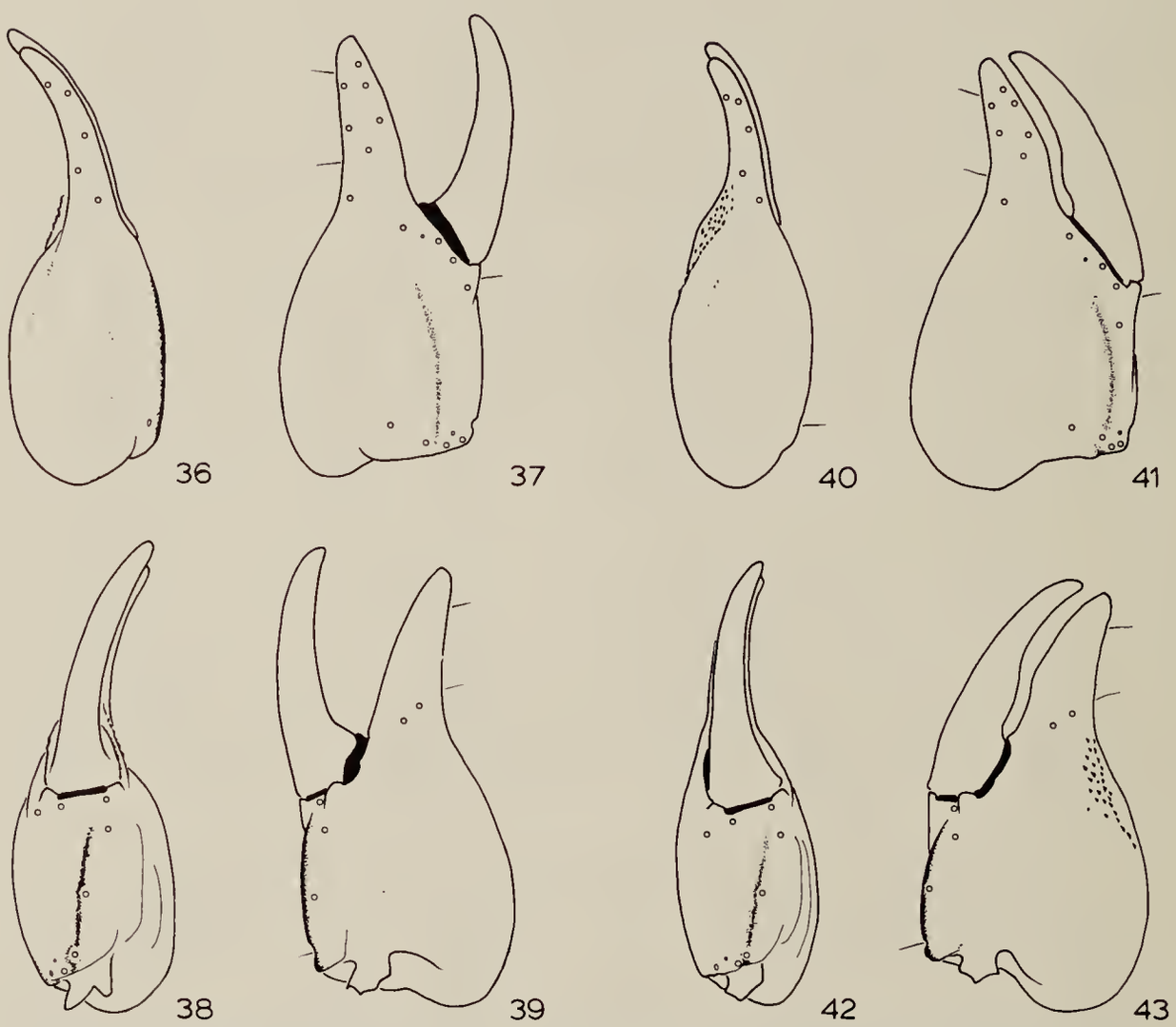


FIGS. 19-27.—External view of the right pedipalp tibia of species of *Didymocentrus* and *Tarsoporosus*, showing trichobothrial pattern: 19, *D. lesueurii* adult female; 20, *D. minor* holotype male; 21, *D. waeringi* adult female; 22, *D. hummelincki* holotype female; 23, *D. hasethi* holotype female; 24, *D. krausi* holotype female; 25, *D. trinitarius* adult male; 26, *D. nitidus* holotype female; 27, *Tarsoporosus kugleri* holotype female.



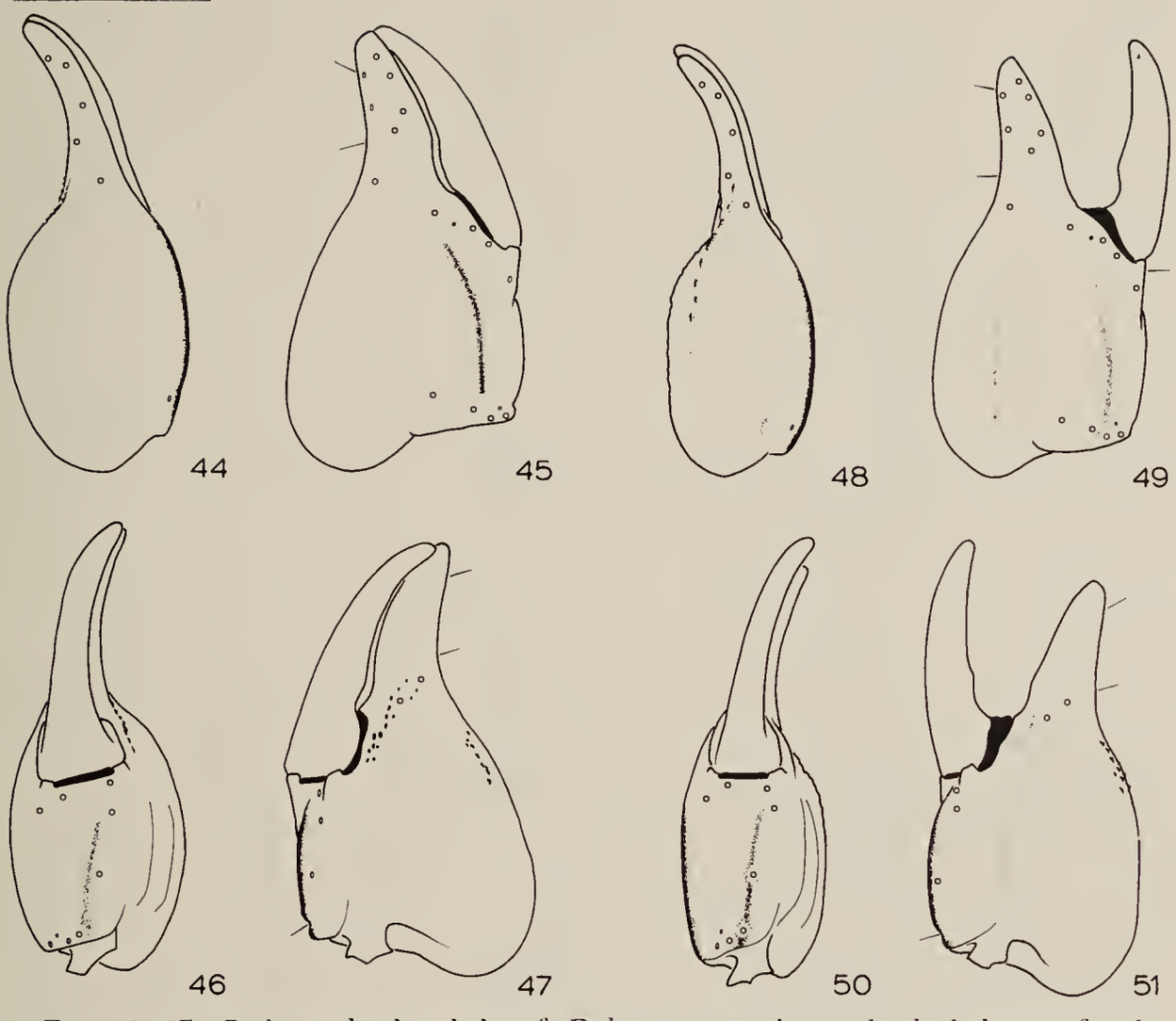
FIGS. 28-31.—Right pedipalp chela of *Didymocentrus lesueurii* holotype female, showing trichobothrial pattern: 28, dorsal aspect; 29, external aspect; 30, ventral aspect; 31, internal aspect.

FIGS. 32-35.—Right pedipalp chela of *Didymocentrus minor* holotype male, showing trichobothrial pattern: 32, dorsal aspect; 33, external aspect; 34, ventral aspect; 35, internal aspect.



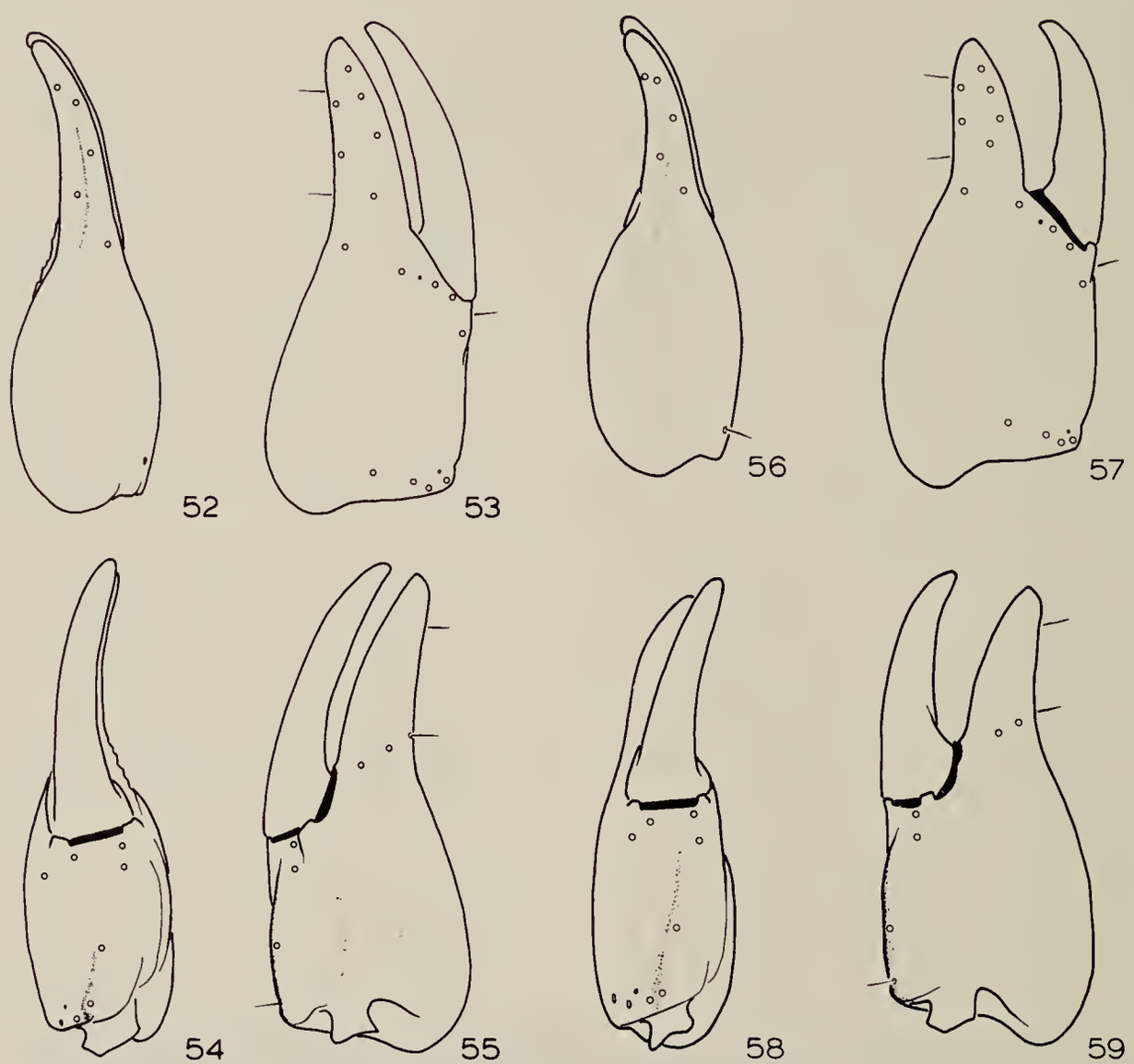
FIGS. 36-39.—Right pedipalp chela of *Didymocentrus waeringi* adult female, showing trichobothrial pattern: 36, dorsal aspect; 37, external aspect; 38, ventral aspect; 39, internal aspect.

FIGS. 40-43.—Right pedipalp chela of *Didymocentrus hasethi* holotype female, showing trichobothrial pattern; 40, dorsal aspect; 41, external aspect; 42, ventral aspect; 43, internal aspect.



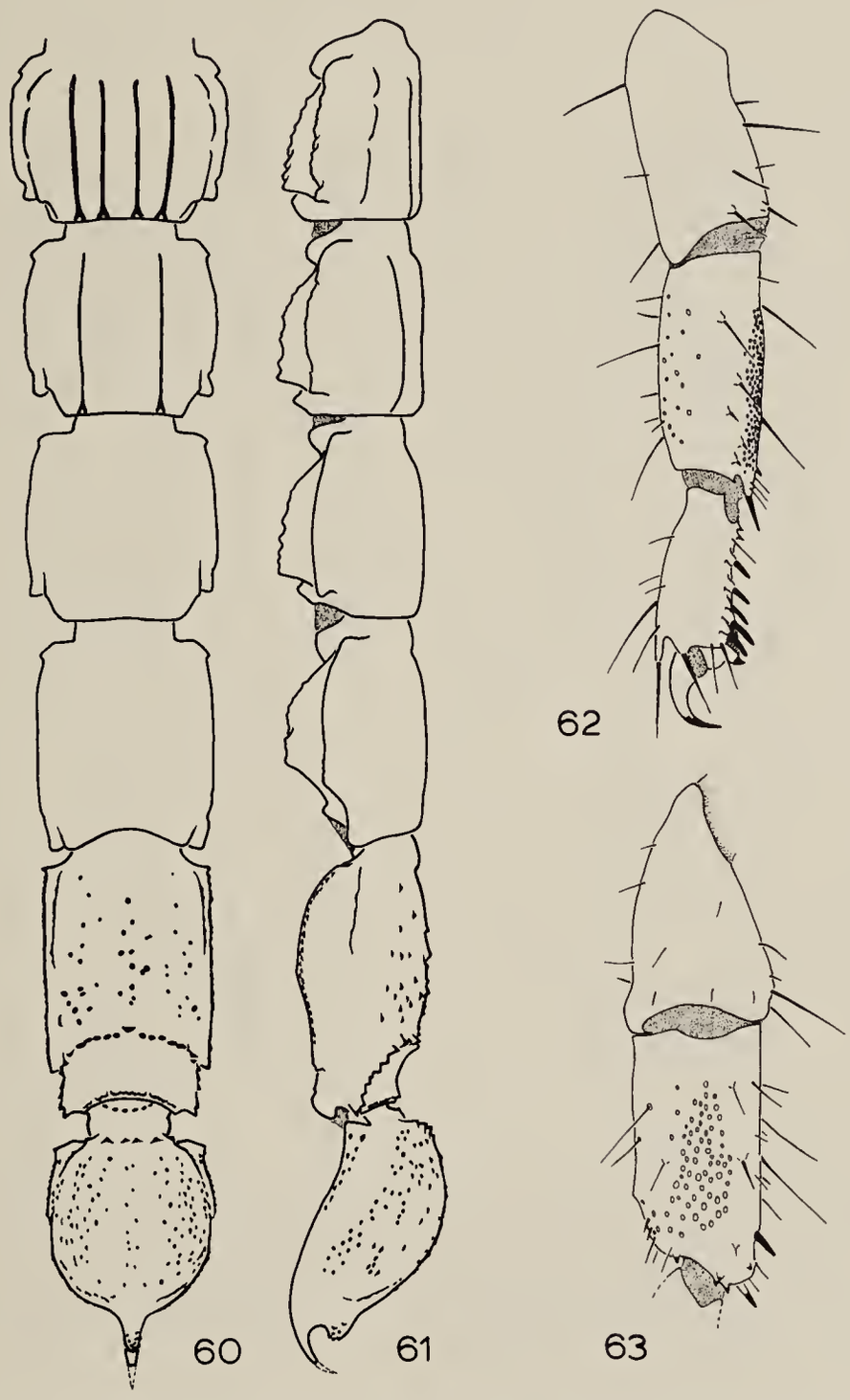
FIGS. 44-47.—Right pedipalp chela of *Didymocentrus hummelincki* holotype female, showing trichobothrial pattern: 44, dorsal aspect; 45, external aspect; 46, ventral aspect; 47, internal aspect.

FIGS. 48-51.—Right pedipalp chela of *Didymocentrus trinitarius* adult male, showing trichobothrial pattern: 48, dorsal aspect; 49, external aspect; 50, ventral aspect; 51, internal aspect.

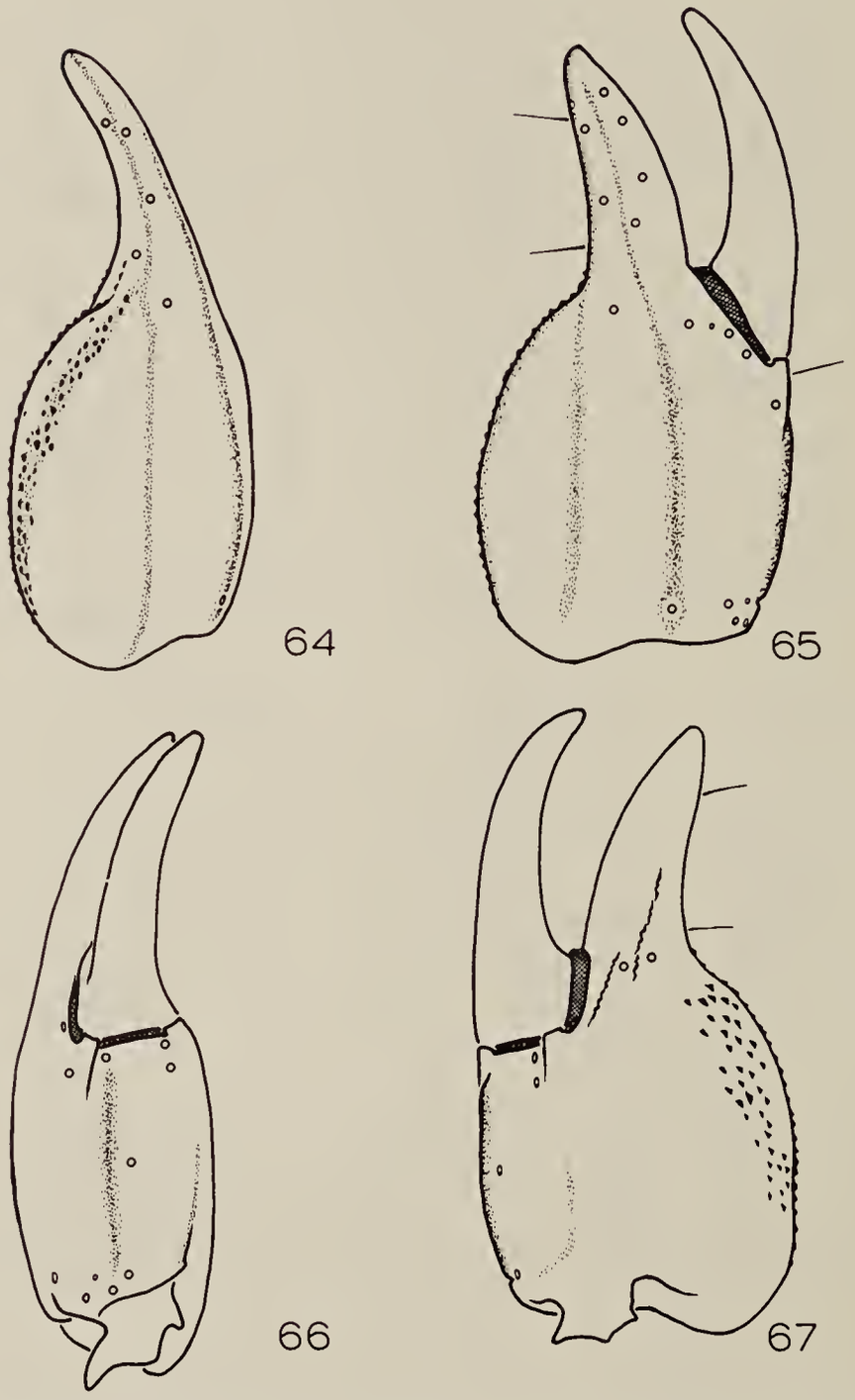


Figs. 52-55.—Right pedipalp chela of *Didymocentrus nitidus* holotype female, showing trichobothrial pattern: 52, dorsal aspect; 53, external aspect; 54, ventral aspect; 55, internal aspect.

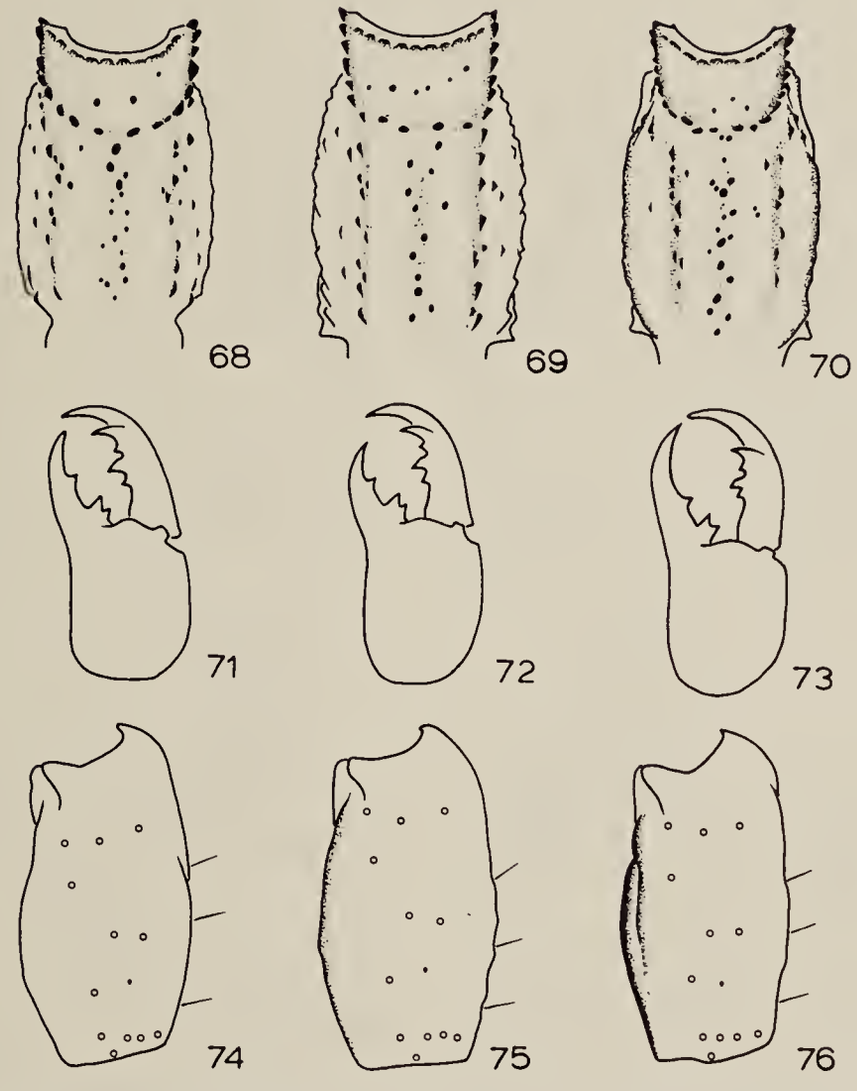
Figs. 56-59.—Right pedipalp chela of *Didymocentrus krausi* holotype female, showing trichobothrial pattern: 56, dorsal aspect; 57, external aspect; 58, ventral aspect; 59, internal aspect.



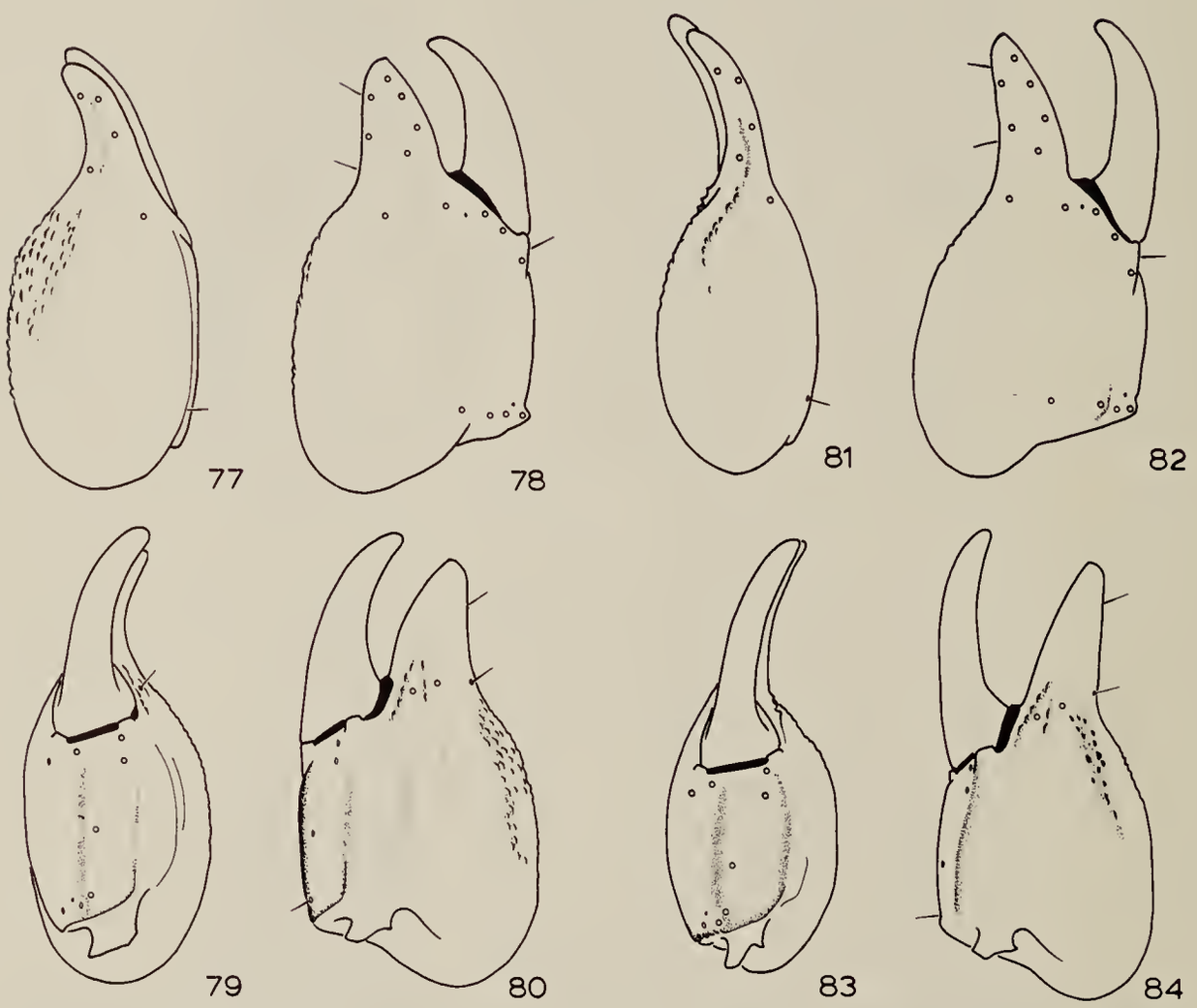
FIGS. 60-63.—*Tarsoporosus kugleri* holotype female: 60, ventral aspect of metasoma; 61, lateral aspect of metasoma; 62, posterior aspect of distal segments of left leg I; 63, ventral aspect of distal segments of left leg I.



FIGS. 64-67.—Right pedipalp chela of *Tarsoporosus kugleri* holotype female, showing trichobothrial pattern: 64, dorsal aspect; 65, external aspect; 66, ventral aspect; 67, internal aspect.

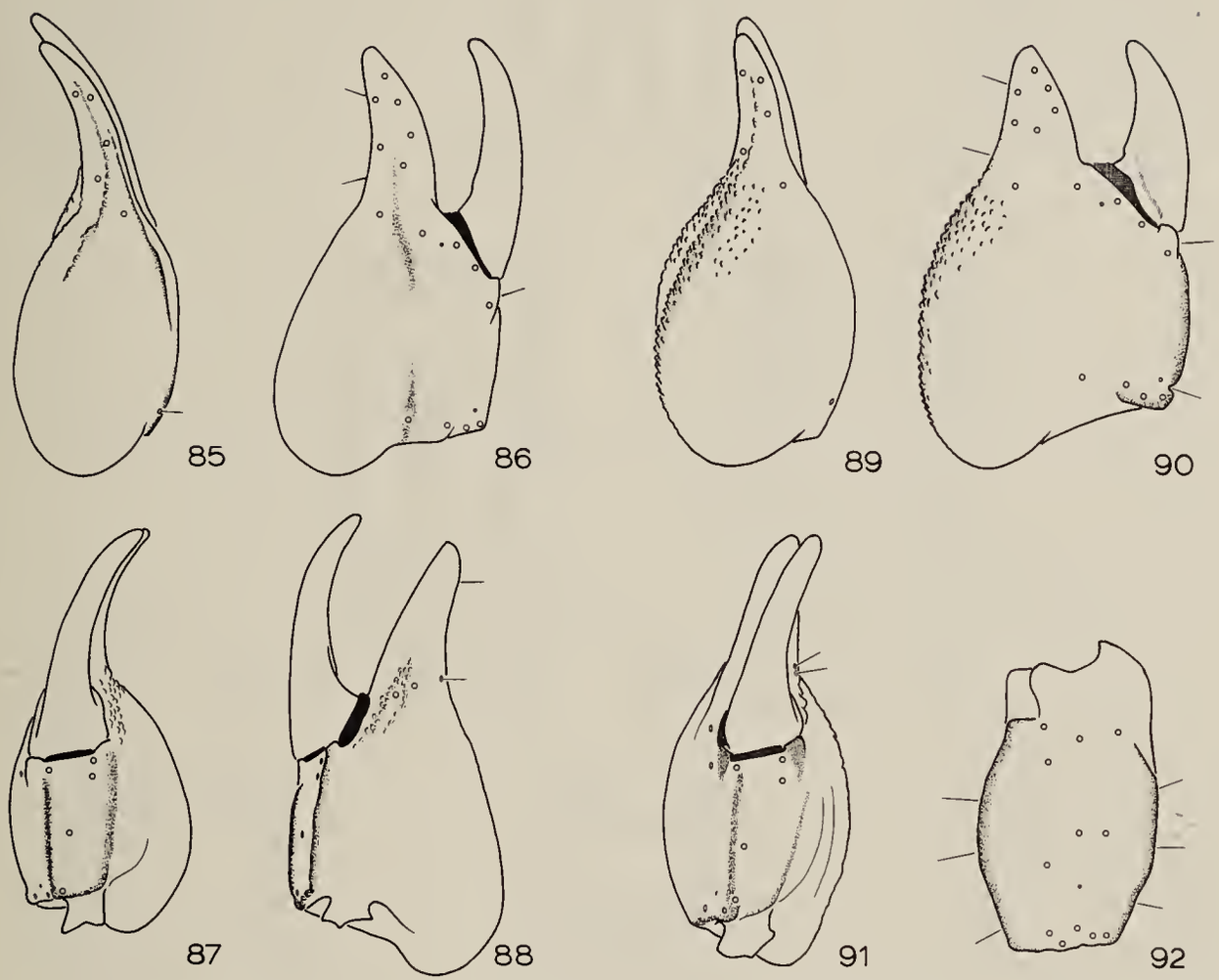


FIGS. 68-76.—Metasomal segment V, chelicera, and pedipalp tibia of *Cazierius* and *Oieclus*. 68-70, ventral aspect of metasomal segment V: 68, *C. politus* lectotype female; 69, *C. gundlachii* adult male; 70, *Oieclus purvesii purvesii* adult male. 71-73, dorsal aspect of chelicera: 71, *C. politus* lectotype female; 72, *C. gundlachii* adult male; 73, *Oieclus purvesii purvesii* adult male. 74-76, external aspect of right pedipalp tibia showing trichobothrial patterns: 74, *C. politus* lectotype female; 75, *C. gundlachii* adult male; 76, *C. scaber* lectotype female.



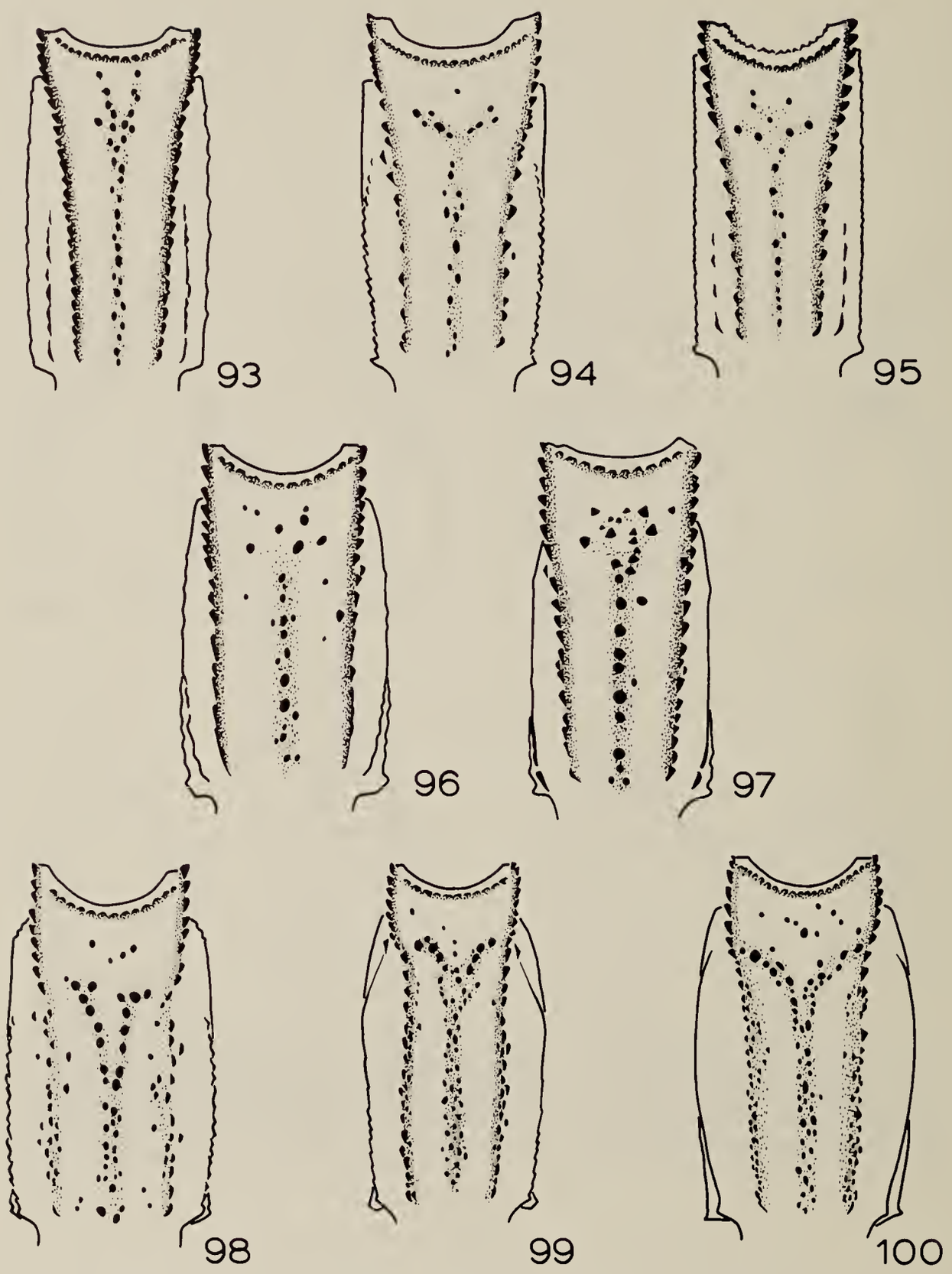
Figs. 77-80.—Right pedipalp chela of *Cazierius gundlachii* adult male, showing trichobothrial pattern: 77, dorsal aspect; 78, external aspect; 79, ventral aspect; 80, internal aspect.

Figs. 81-84.—Right pedipalp chela of *Cazierius politus* lectotype female, showing trichobothrial pattern: 81, dorsal aspect; 82, external aspect; 83, ventral aspect; 84, internal aspect.

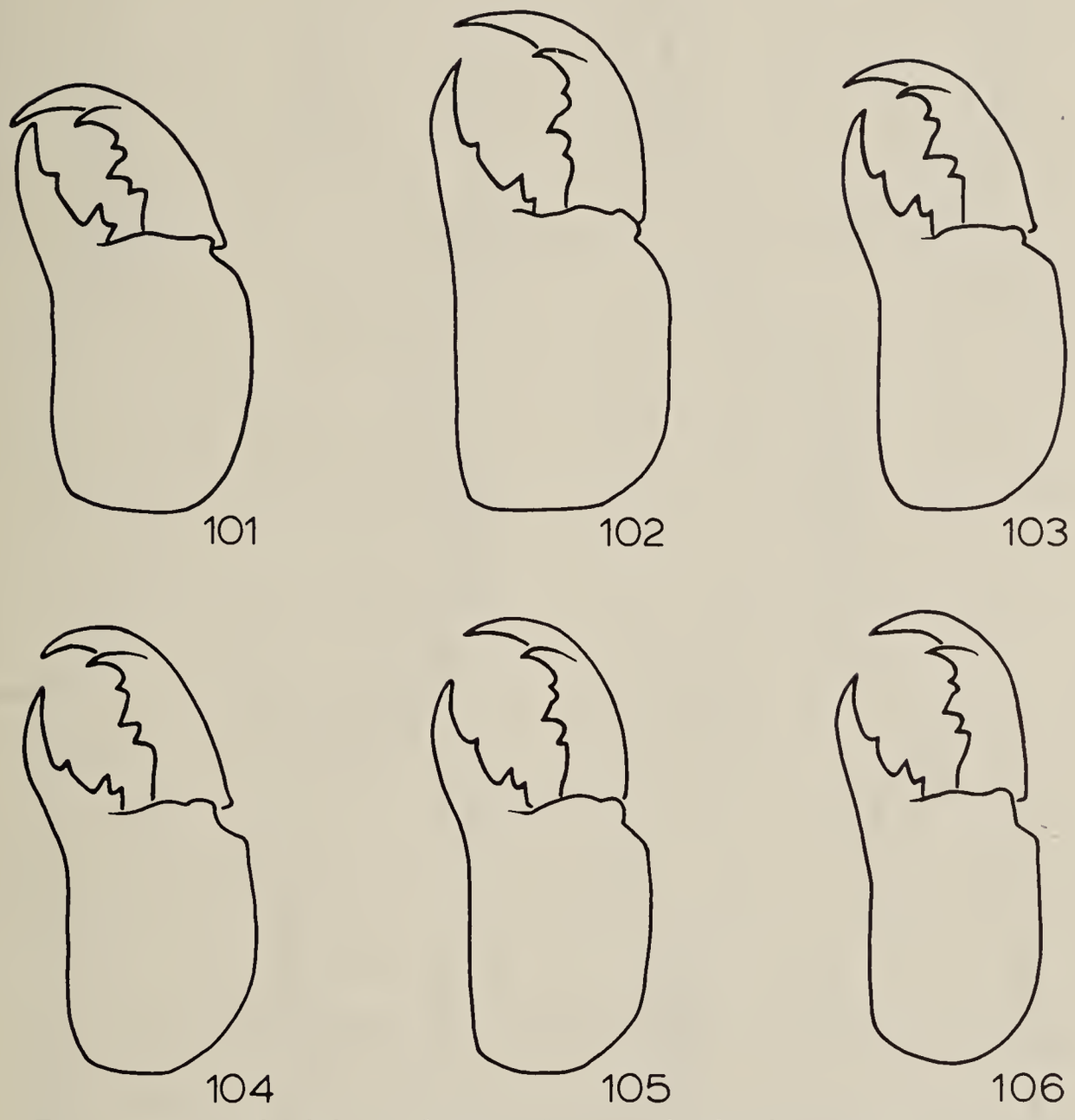


FIGS. 85-88.—Right pedipalp chela of *Cazierius scaber* lectotype female, showing trichobothrial pattern:85, dorsal aspect; 86, external aspect; 87, ventral aspect; 88, internal aspect.

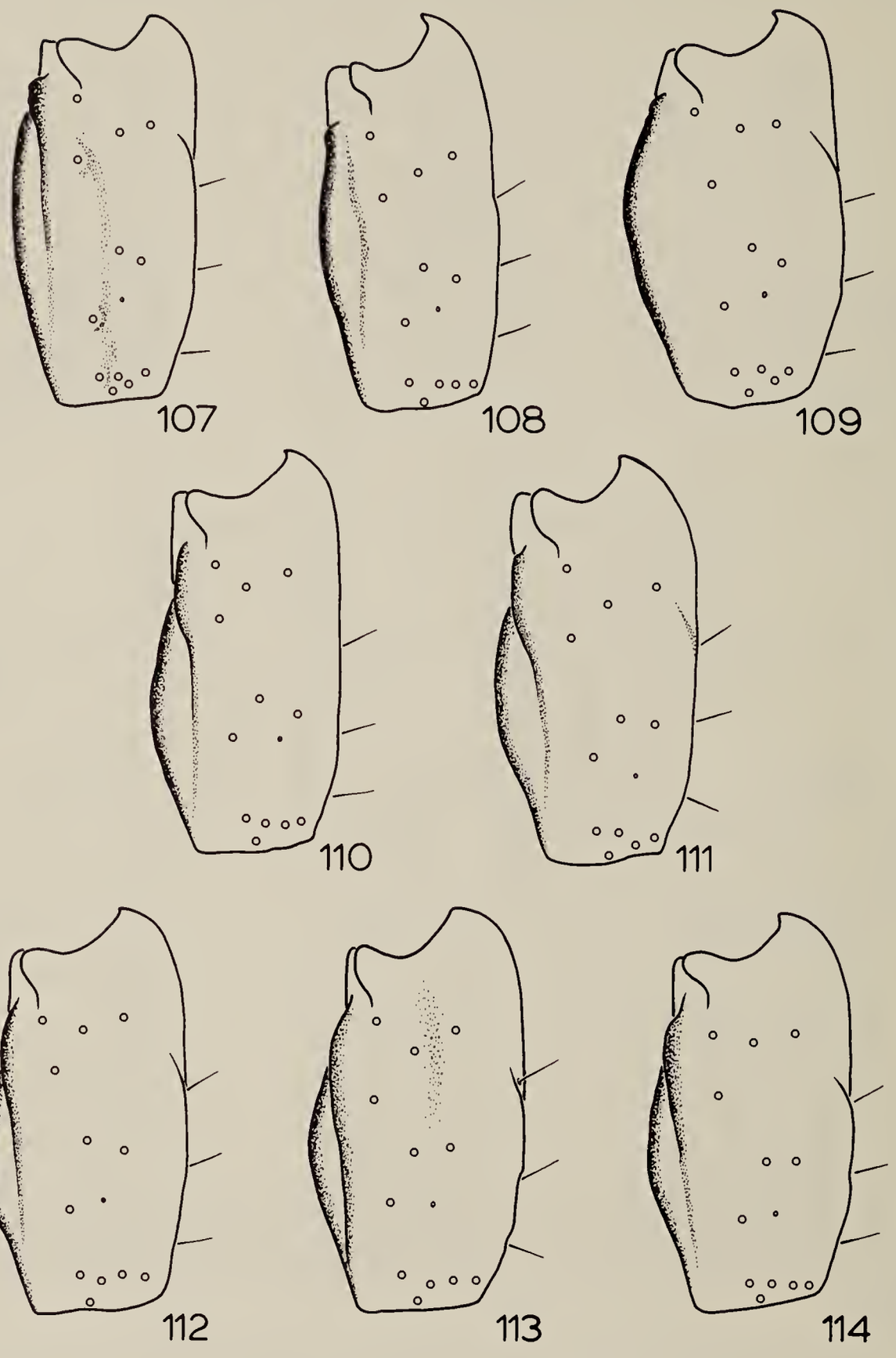
FIGS. 89-92.—Right pedipalp of *Oieclus purvesii purvesii* adult male, showing trichobothrial patterns: 89, dorsal aspect of chela; 90, external aspect of chela; 91, ventral aspect of chela; 92, external aspect of tibia.



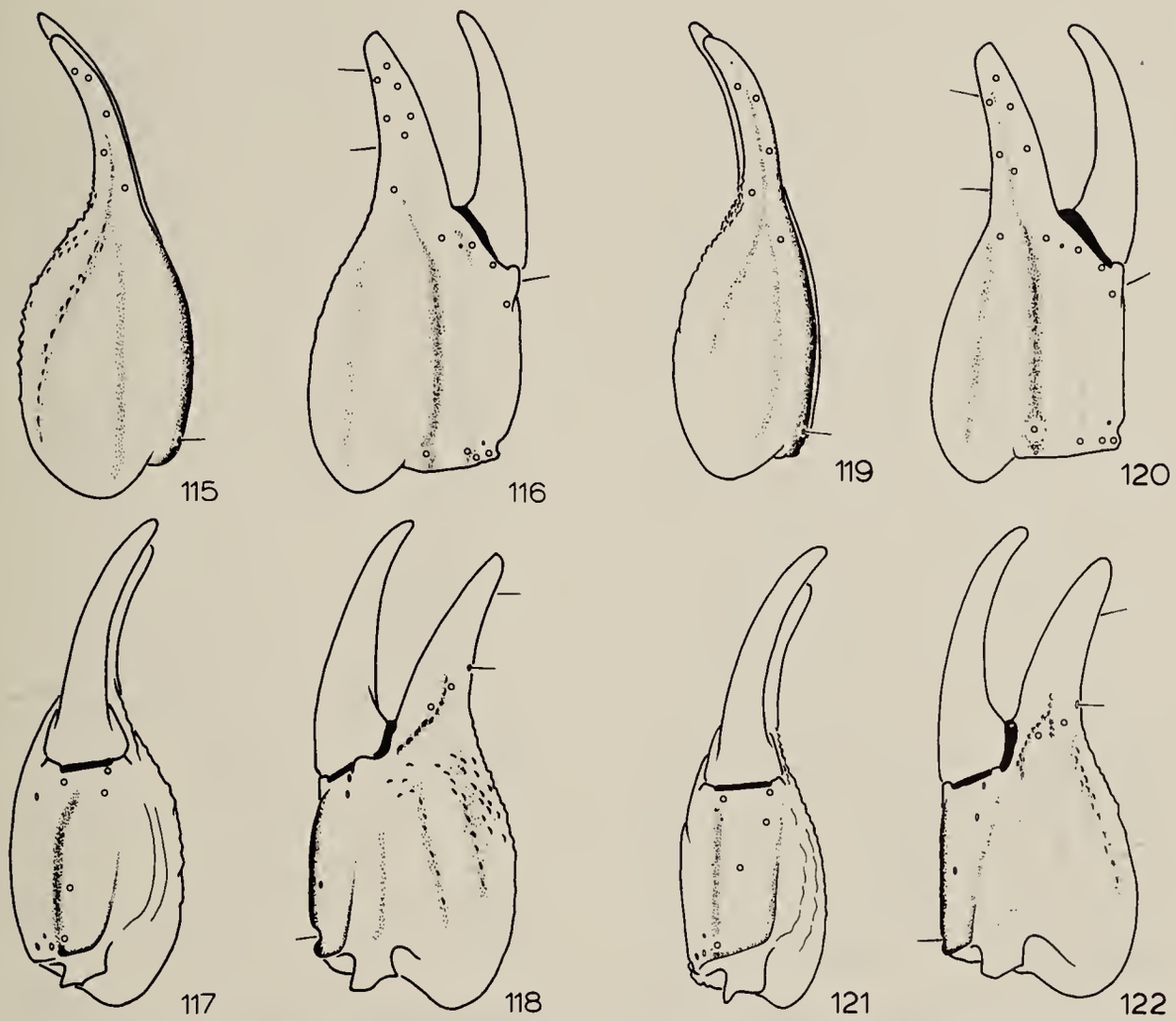
FIGS. 93-100.—Metasomal segment V of species of *Heteronebo*, ventral aspects: 93, *H. granti* lectotype female; 94, *H. elegans* holotype female; 95, *H. forbesii* lectotype female; 96, *H. portoricensis* holotype female; 97, *H. vachoni* holotype male; 98, *H. bermudezi* adult female; 99, *H. caymanensis* holotype male; 100, *H. jamaicae* holotype male.



FIGS. 101-106.—Right chelicera of species of *Heteronebo*, dorsal aspect: 101, *H. caymanensis* holotype male; 102, *H. elegans* holotype female; 103, *H. portoricensis* holotype female; 104, *H. vachoni* holotype male; 105, *H. jamaicae* holotype male; 106, *H. bermudezi*, adult male.

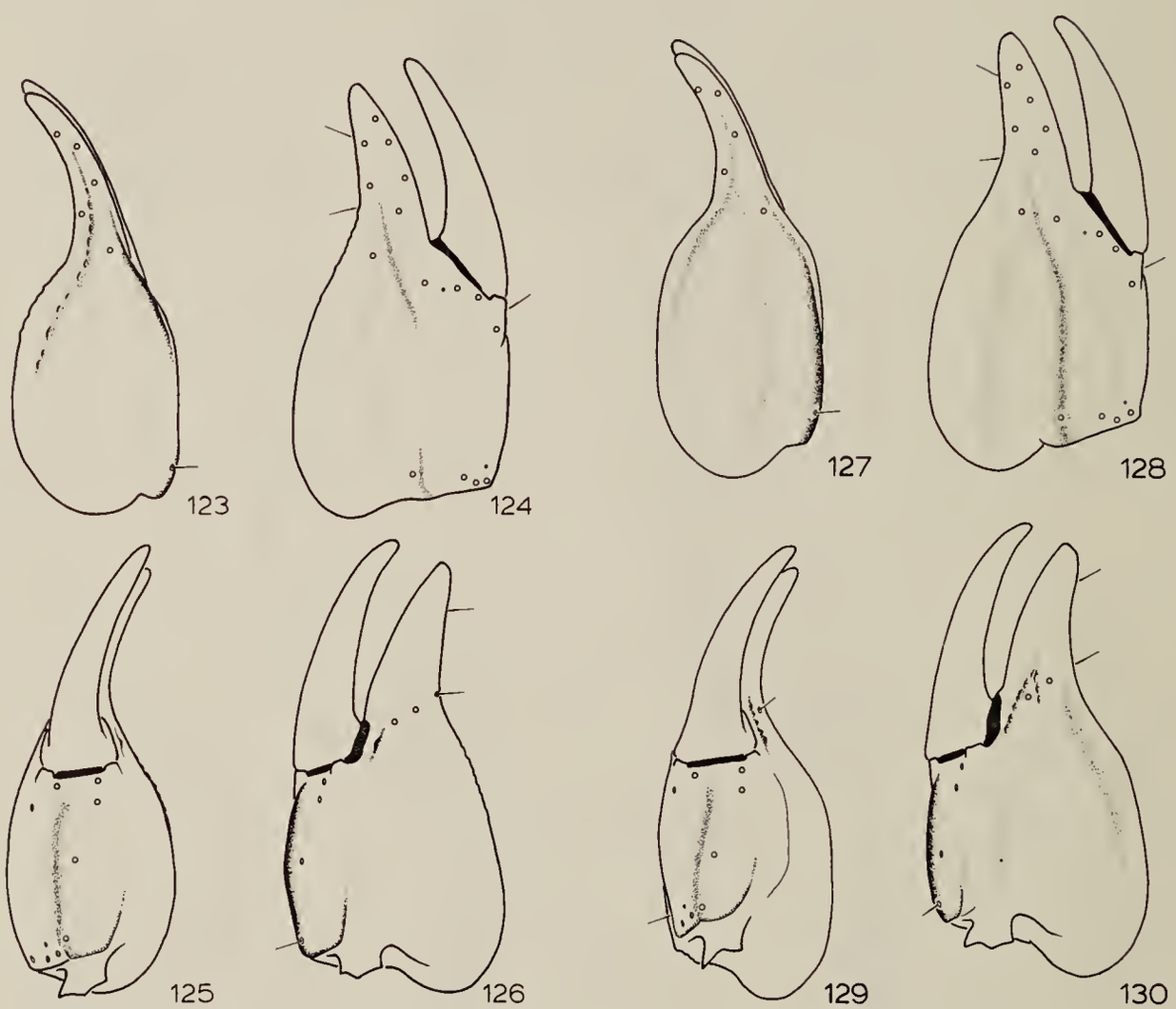


FIGS. 107-114.—External view of right pedipalp tibia of species of *Heteronebo*, showing trichobothrial patterns: 107, *H. granti* lectotype female; 108, *H. elegans* holotype female; 109, *H. forbesii* lectotype female; 110, *H. portoricensis* holotype female; 111, *H. vachoni* holotype male; 112, *H. bermudezi* adult male; 113, *H. caymanensis* holotype male; 114, *H. jamaicae* holotype male.



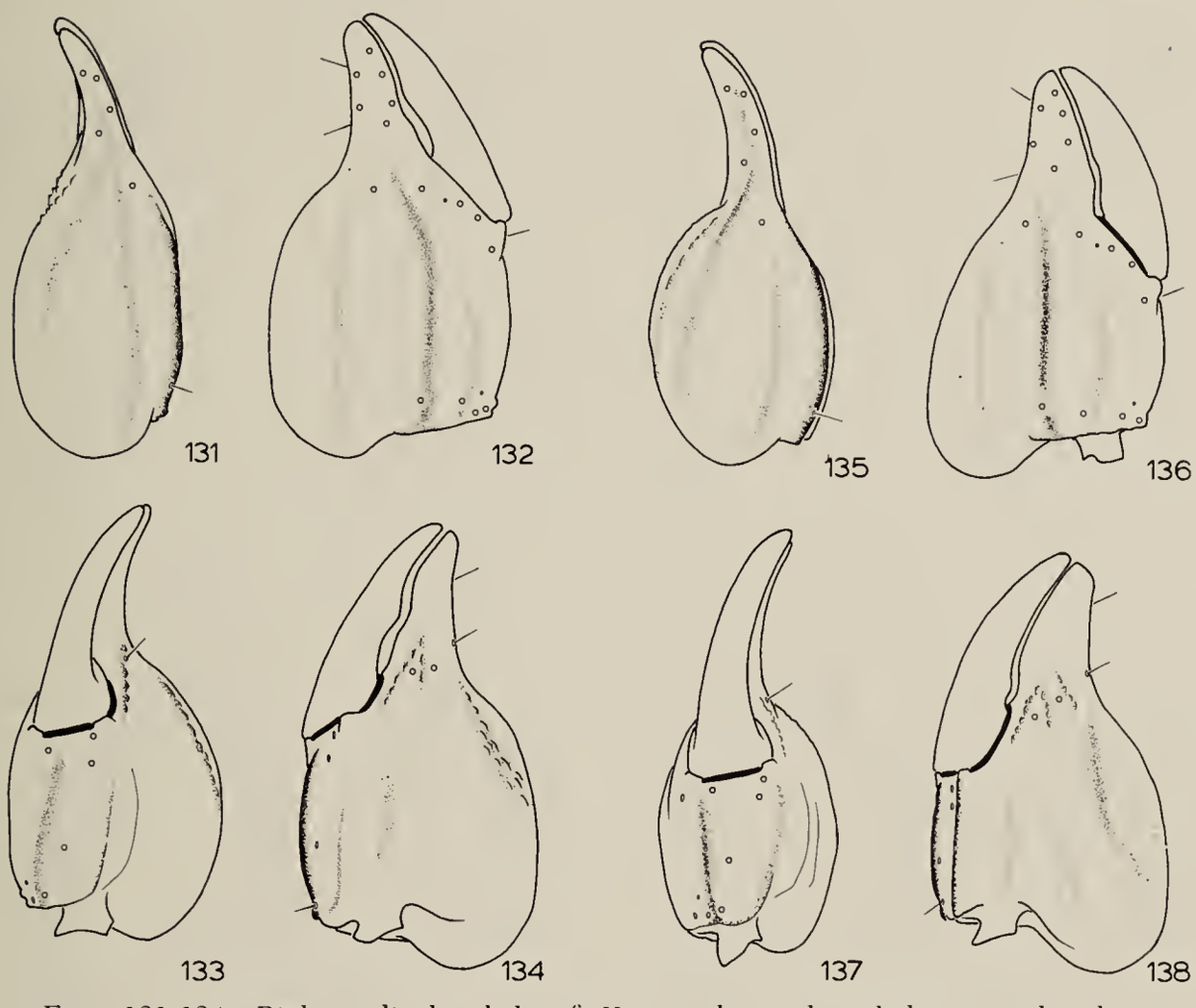
Figs. 115-118.—Right pedipalp chela of *Heteronebo granti* lectotype female, showing trichobothrial pattern: 115, dorsal aspect; 116, external aspect; 117, ventral aspect; 118, internal aspect.

Figs. 119-122.—Right pedipalp chela of *Heteronebo elegans* holotype female, showing trichobothrial pattern: 119, dorsal aspect; 120, external aspect; 121, ventral aspect; 122, internal aspect.



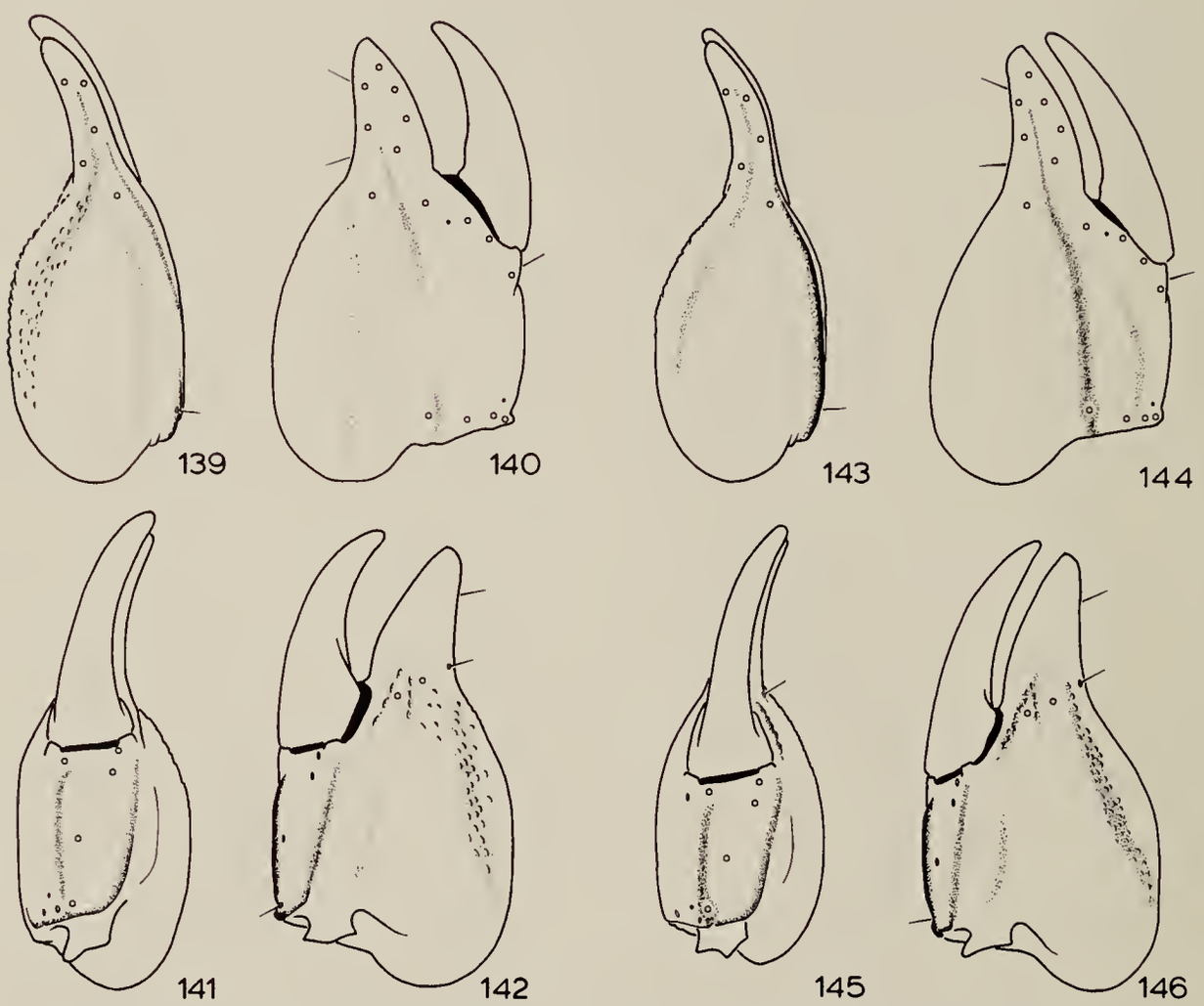
Figs. 123-126.—Right pedipalp chela of *Heteronebo forbesii* lectotype female, showing trichobothrial pattern: 123, dorsal aspect; 124, external aspect; 125, ventral aspect; 126, internal aspect.

Figs. 127-130.—Right pedipalp chela of *Heteronebo portoricensis* holotype female, showing trichobothrial pattern: 127, dorsal aspect; 128, external aspect; 129, ventral aspect; 130, internal aspect.



Figs. 131-134.—Right pedipalp chela of *Heteronebo vachoni* holotype male, showing trichobothrial pattern: 131, dorsal aspect; 132, external aspect; 133, ventral aspect; 134, internal aspect.

Figs. 135-138.—Right pedipalp chela of *Heteronebo caymanensis* holotype male, showing trichobothrial pattern: 135, dorsal aspect; 136, external aspect; 137, ventral aspect; 138, internal aspect.



FIGS. 139-142.—Right pedipalp chela of *Heteronebo bermudezi* adult male, showing trichobothrial pattern: 139, dorsal aspect; 140, external aspect; 141, ventral aspect; 142, internal aspect.

FIGS. 143-146.—Right pedipalp chela of *Heteronebo jamaicae* holotype male, showing trichobothrial pattern: 143, dorsal aspect; 144, external aspect; 145, ventral aspect; 146, internal aspect.

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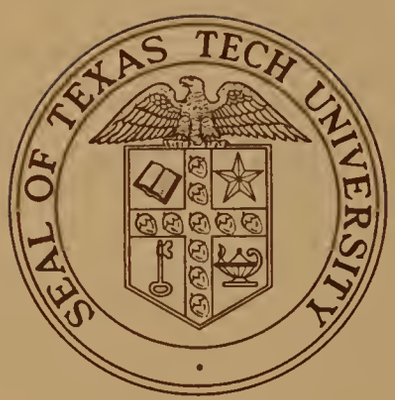
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